



UNITED STATES MARINE CORPS  
MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE  
PSC BOX 20005  
CAMP LEJEUNE NC 28542-0005

5720  
MCIEAST-MCBCAMLEJ2013F0038  
20 DEC 2012

MuckRock News  
Department MR 1544  
Post Office Box 55819  
Boston, MA 02205-5819

Attention: Mr. Shawn Musgrave

SUBJECT: YOUR FREEDOM OF INFORMATION ACT CASE MCIEAST-MCBCAMLEJ20130038

This letter is in response to your Freedom of Information Act (FOIA) request of October 25, 2012 was received on October 25, 2012, enclosure (1).

We have categorized you as a "News Media Requester" for the purpose of assessing FOIA processing fees. As such, you are entitled records at the cost of reproduction alone (excluding charges for the first 100 pages). In this instance, since your search and/or duplication fees were less than your free entitlement, there is no charge for the processing of your request.

A search by the Director of the Regional Contracting Office, with one document related to drone training located responsive to your request. Also, a search was conducted by a Aviation Plans and Policy employee which located twelve documents responsive to your request.

In your request you sought a copy of the following documents:

a. Any requests for proposals, proposals submitted by vendors, contracts, budgets or cost allocations for the purchase and/or use of aerial drones, UAs, UAVs, and UASs (hereinafter "drones");

(1) Contract M67001-10-P-1298 was located and released in full and is provided as enclosure (2).

b. Any policies, guidelines, manuals and/or instructions on department use of drones, including on the legal process required (such as a warrant or court order), if any, before operating a drone;

(1) NKT-VMU2 Ground Based Sense and Avoid (GBSAA) Letter of Agreement of October 23, 2012, withheld in its entirety under exemption (b)(2), enclosure (3).

(2) Cherry Point GBSAA Approval Plan of February 14, 2011, unsigned copy, released in full and is provided as enclosure (4).

(3) FAA Certificate of Authorization of December 9, 2011, released in full and is provided as enclosure (5).

(4) NAVAIR GBSAA Safe for Use certification of June 10, 2011, released in full and is provided as enclosure (6).

(5) Stone Bay UAS Letter of Agreement of July 7, 2011; Marine Corps Installations East support of U.S. Marine Corps Forces, Special Operations Command initiative, released in full and is provided as enclosure (7).



20 DEC 2012

(6) Cherry Point Global Hawk Letter of Agreement of June 26, 2007, Other UAS policy documents may be on file at Marine Corps Air Station (MCAS) Cherry Point, withheld in its entirety under exemption (b)(2), enclosure (8).

(7) Beaufort Global Hawk Letter of Agreement of June 15, 2007; Other UAS policy documents may be on file at MCAS Beaufort, withheld in its entirety under exemption (b)(2), enclosure (9).

(8) Secretary of Defense UAS Memorandum Class D Procedures of April 30, 2008, released in full and is provided as enclosure (10).

c. Any departmental records concerning this department's use of drones now or plans to use drones in the future including investigations or instances in which this department is using or plans to use drones, or how it plans to support, manage or oversee the usage of drones by another department or office;

(1) State of North Carolina Unmanned Aircraft Systems (UAS) Task Force Meeting No 1, June 9, 2011 provided as enclosure (11)

(2) NC UAS TF Trip Report June 9, 2011, withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (12).

(3) NC UAS TF Trip Report March 27, 2012 withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (13).

(4) NC UAS TF Trip Report July 19, 2012 withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (14).

d. The altitude at which drones can or do fly;

(1) Stone Bay, below 1,200 feet above ground level;

(2) Cherry Point Class D airspace: 1,000-2,500 feet mean sea level; and

(3) Cherry Point North and South transit volumes: 2,500-3,000 feet mean sea level.

e. Drones ability to carry weapons; no documents were located responsive to your request.

Enclosures (3), (4), (5), (8), (9), and (11), contain unclassified homeland security related information dealing with critical infrastructure as defined by the HSPD 7: Critical Infrastructure Identification, prioritization, and protection also, 42 U.S.C. 5195c. These enclosures discuss MCAS Cherry Point policies and procedures for the operation of unmanned aerial vehicles that are Department of Defense intelligence assets. This information is predominantly internal, and its disclosure would risk circumvention of the Department of the Navy regulations or statutes. This information directly relates to critical infrastructure per exemption 5 U.S.C. 552 (b)(2).

Enclosure (1)

2012-250

Drake CIV Julie C

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From: Shawn Musgrave [shawnmusgrave@gmail.com]  
Sent: Thursday, October 25, 2012 2:38 PM  
To: Drake CIV Julie C  
Subject: UAV/drone documents -- Camp Lejeune

Ms. Drake:

Per our phone conversation, MuckRock would like to clarify its request:

-Please conduct a search for any proposals, proposals submitted by vendors, contracts, budgets or cost allocations relating to aerial drones, unmanned aerial vehicles (UAVs) and unmanned aerial systems (UASs). Please search for all three designations, which are interchangeable.

-Please include documents pertaining to purchase and use of these vehicles, as well as operator training.

Additionally, please clarify whether an additional search will be conducted for the remaining portion of our original request beyond contracts and purchase documents -- we also requested departmental records, policies, manuals, etc related to use of drones by USMC.

Thank you for your help.

Best,  
Shawn Musgrave  
MuckRock

Drake CIV Julie C

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Subject: FW: TRANSFER OF FOIA REQUEST USMC-HQ 2012F070690 See Below (FW: Freedom of Information Request: USMC Drone Documents)

-----Original Message-----

From: [1544-05612213@requests.muckrock.com](mailto:1544-05612213@requests.muckrock.com) [<mailto:1544-05612213@requests.muckrock.com>]

Sent: Friday, July 20, 2012 14:57

To: SMB HQMC FOIA

Subject: ~~Freedom of Information Request: USMC Drone Documents~~

July 20, 2012

Marines

FOIA/PA Manager (Code ARSF)

COMMANDANT OF THE MARINE CORPS

HEADQUARTERS, U.S. MARINE CORPS (ARSF)

2 NAVY ANNEX

WASHINGTON DC 20380-1775

To Whom It May Concern:

This is a request under the Freedom of Information Act. I hereby request the following records:

1. any requests for proposals, proposals submitted by vendors, contracts, budgets or cost allocations for the purchase and/or use of aerial drones, UAs, UAVs, and UASs (hereinafter "drones"); *Contract*
2. any policies, guidelines, manuals and/or instructions on department use of drones, including on the legal process required (such as a warrant or court order), if any, before operating a drone; *8*
3. any departmental records concerning this department's use of drones now or plans to use drones in the future including:
  - a. the types of investigations or instances in which this department is using or plans to use drones, or how it plans to support, manage or oversee the usage of drones by another department or office;
  - b. policies, guidelines, manuals and/or instructions on storage requirements or procedures for video or static images obtained through use of drones, including retention times;
  - c. the altitude at which drones can or do fly;
  - d. drones' ability to carry weapons.

I also request that, if appropriate, fees be waived as I believe this request is in the public interest. The requested documents will be made available to the general public free of charge as part of the public information service at MuckRock.com, processed by a

representative of the news media/press and is made in the process of news gathering and not for commercial usage.

In the event that fees cannot be waived, I would be grateful if you would inform me of the total charges in advance of fulfilling my request. I would prefer the request filled electronically, by e-mail attachment if available or CD-ROM if not.

Thank you in advance for your anticipated cooperation in this matter. I look forward to receiving your response to this request within 20 business days, as the statute requires.

Sincerely,

Drone Watch

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Filed via MuckRock.com

E-mail (Preferred): [1544-05612213@requests.muckrock.com](mailto:1544-05612213@requests.muckrock.com)

For mailed responses, please address (see note):

MuckRock News

DEPT MR 1544

PO Box 55819

Boston, MA 02205-5819

PLEASE NOTE the new address as well as the fact that improperly addressed (i.e., with the requester's name rather than MuckRock News) requests might be returned by the USPS as undeliverable.

Enclosure (2)

<b>SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS</b> <b>OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, AND 30</b>				1. REQUISITION NUMBER M9317710SU00149		PAGE 1 OF 18	
2. CONTRACT NO. M67001-10-P-1298		3. AWARD/EFFECTIVE DATE 15-Jun-2010		4. ORDER NUMBER		5. SOLICITATION NUMBER	
7. FOR SOLICITATION INFORMATION CALL:		a. NAME				b. TELEPHONE NUMBER (No Collect Calls)	
9. ISSUED BY  CONTRACTING DEPARTMENT P O BOX 8368 (BLDG 1116) CAMP LEJEUNE NC 28547-8368  TEL: FAX: 910-451-2331		CODE M67001		10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED  SET ASIDE: % FOR  <input type="checkbox"/> SB <input type="checkbox"/> HUBZONE SB <input type="checkbox"/> 8(A) <input type="checkbox"/> SVC-DISABLED VET-OWNED SB <input type="checkbox"/> EMERGING SB  SIZE STD: 750 NAICS: 334220		11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE  13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)  13b. RATING  14. METHOD OF SOLICITATION <input type="checkbox"/> RFQ <input type="checkbox"/> IFB <input type="checkbox"/> RFP	
15. DELIVER TO OPERATIONS AND TRAINING DEPARTMENT LISA A. GRAY BLDG 56 POST LANE CAMP LEJEUNE NC 28547		CODE M93177		16. ADMINISTERED BY CONTRACTING DEPARTMENT ATTN: CONTRACT ADMINISTRATION PHONE: (910) 449-9279 P.O. BOX 8368 MCB CAMP LEJEUNE NC 28547		CODE M67001	
17a. CONTRACTOR/OFFEROR  UAV PRO INC JAY WILLMOTT 873 W PARADE AVE BLACKSTONE VA 23824-0430  TEL. 4342924914		CODE 3BNE2		18a. PAYMENT WILL BE MADE BY  DFAS-COLUMBUS CENTER P.O. BOX 369022 ATTN: KANSAS COLUMBUS OH 43236-9022		CODE M67443	
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER		18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED <input checked="" type="checkbox"/> SEE ADDENDUM					
19. ITEM NO.	20. SCHEDULE OF SUPPLIES/ SERVICES			21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	SEE SCHEDULE						
25. ACCOUNTING AND APPROPRIATION DATA  See Schedule						26. TOTAL AWARD AMOUNT (For Govt. Use Only)  \$42,500.00	
<input type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4, FAR 52.212-3, 52.212-5 ARE ATTACHED.				ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED			
<input checked="" type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4, FAR 52.212-5 IS ATTACHED.				ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED			
28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 1 COPIES  <input checked="" type="checkbox"/> TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.  REF. Quote # 08102010-1				29. AWARD OF CONTRACT: REFERENCE  <input type="checkbox"/> OFFER DATED . YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS: SEE SCHEDULE			
30a. SIGNATURE OF OFFEROR/CONTRACTOR				31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER)		31c. DATE SIGNED	
				<i>Tracy E. Fuls</i>		15-Jun-2010	
30b. NAME AND TITLE OF SIGNER (TYPE OR PRINT)		30c. DATE SIGNED		31b. NAME OF CONTRACTING OFFICER (TYPE OR PRINT)  TRACY E. FULS /  TEL: 910-451-3011 EMAIL: tracy.fuls@usmc.mil			

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FAR (48 CFR) 53.212

**ENCLOSURE (2)**



**SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS  
(CONTINUED)**

PAGE 2 OF 18

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/ SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	SEE SCHEDULE				

32a. QUANTITY IN COLUMN 21 HAS BEEN

☐ RECEIVED ☐ INSPECTED ☐ ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED: \_\_\_\_\_

32b. SIGNATURE OF AUTHORIZED GOVERNMENT  
REPRESENTATIVE

32c. DATE

32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT  
REPRESENTATIVE

32e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE

32f. TELEPHONE NUMBER OF AUTHORIZED GOVERNMENT REPRESENTATIVE

32g. E-MAIL OF AUTHORIZED GOVERNMENT REPRESENTATIVE

33. SHIP NUMBER

34. VOUCHER NUMBER

35. AMOUNT VERIFIED  
CORRECT FOR

36. PAYMENT

37. CHECK NUMBER

☐ PARTIAL

☐ FINAL

☐ COMPLETE

☐ PARTIAL

☐ FINAL

38. S/R ACCOUNT NUMBER

39. S/R VOUCHER NUMBER

40. PAID BY

41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT

42a. RECEIVED BY (Print)

41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER

41c. DATE

42b. RECEIVED AT (Location)

42c. DATE REC'D (YY/MM/DD)

42d. TOTAL CONTAINERS

## Section SF 1449 - CONTINUATION SHEET

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	MVR-III Mini-Rover Tri-Band Video Receiver FFP MVR-III Mini-Rover Tri-Band Video Receiver FOB: Destination MILSTRIP: M9317710SU00149 PURCHASE REQUEST NUMBER: M9317710SU00149	2	Each	\$13,750.00	\$27,500.00

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NET AMT	\$27,500.00
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ACRN AA	\$27,500.00
CIN: M9317710SU001490001	

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002	Tower/Roof Mount Tri-Band Amplified Antenna System FFP Tower/Roof Mount Tri-Band Amplified Antenna System FOB: Destination MILSTRIP: M9317710SU00149 PURCHASE REQUEST NUMBER: M9317710SU00149	2	Each	\$7,500.00	\$15,000.00

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NET AMT	\$15,000.00
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ACRN AA	\$15,000.00
CIN: M9317710SU001490002	

## INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
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0001	Destination	Government	Destination	Government
0002	Destination	Government	Destination	Government

## DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	07-SEP-2010	2	OPERATIONS AND TRAINING DEPARTMENT LISA A. GRAY BLDG 56 POST LANE CAMP LEJEUNE NC 28547 451-8905 FOB: Destination	M93177
0002	07-SEP-2010	2	(SAME AS PREVIOUS LOCATION) FOB: Destination	M93177

## ACCOUNTING AND APPROPRIATION DATA

AA: I70110627A0 252 67001 067443 2D M93177  
COST CODE: 0SU00149TMAA  
AMOUNT: \$42,500.00  
CIN M9317710SU001490001: \$27,500.00  
CIN M9317710SU001490002: \$15,000.00

## CLAUSES INCORPORATED BY FULL TEXT

## 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

WWW.ARNET.GOV/FAR

(End of clause)

## CLAUSES INCORPORATED BY REFERENCE

52.204-7 Central Contractor Registration

APR 2008

52.211-17	Delivery of Excess Quantities	SEP 1989
52.212-4	Contract Terms and Conditions--Commercial Items	MAR 2009
52.247-34	F.O.B. Destination	NOV 1991
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7004 Alt A	Central Contractor Registration (52.204-7) Alternate A	SEP 2007

## CLAUSES INCORPORATED BY FULL TEXT

## 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS (APR 2010)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

(1) 52.222-50, Combating Trafficking in Persons (FEB 2009) (22 U.S.C. 7104(g)).

Alternate I (Aug 2007) of 52.222-50 (22 U.S.C. 7104(g)).

(2) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).

(3) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Pub. L. 108-77, 108-78).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)

\_\_\_ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (SEP 2006), with Alternate I (OCT 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).

\_\_\_ (2) 52.203-13, Contractor Code of Business Ethics and Conduct (APR 2010)(Pub. L. 110-252, Title VI, Chapter 1 (41 U.S.C. 251 note)).

\_\_\_ (3) 52.203-15, Whistleblower Protections under the American Recovery and Reinvestment Act of 2009 (MAR 2009) (Section 1553 of Pub. L. 111-5). (Applies to contracts funded by the American Recovery and Reinvestment Act of 2009.)

\_\_\_ (4) 52.204-11, American Recovery and Reinvestment Act—Reporting Requirements (MAR 2009) (Pub. L. 111-5).

\_\_\_ (5) 52.219-3, Notice of Total HUBZone Set-Aside (Jan 1999) (15 U.S.C. 657a).

\_\_\_ (6) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JUL 2005) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

\_\_\_ (7) [Reserved].

- ☒ (8)(i) 52.219-6, Notice of Total Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).
- ☐ (ii) Alternate I (OCT 1995) of 52.219-6.
- ☐ (iii) Alternate II (MAR 2004) of 52.219-6.
- ☐ (9)(i) 52.219-7, Notice of Partial Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).
- ☐ (ii) Alternate I (OCT 1995) of 52.219-7.
- ☐ (iii) Alternate II (MAR 2004) of 52.219-7.
- ☐ (10) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637 (d)(2) and (3)).
- ☐ (11)(i) 52.219-9, Small Business Subcontracting Plan (APR 2008) (15 U.S.C. 637(d)(4)).
- ☐ (ii) Alternate I (OCT 2001) of 52.219-9
- ☐ (iii) Alternate II (OCT 2001) of 52.219-9.
- ☐ (12) 52.219-14, Limitations on Subcontracting (DEC 1996) (15 U.S.C. 637(a)(14)).
- ☐ (13) 52.219-16, Liquidated Damages--Subcontracting Plan (JAN 1999) (15 U.S.C. 637(d)(4)(F)(i)).
- ☐ (14)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (OCT 2008) (10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).
- ☐ (ii) Alternate I (JUNE 2003) of 52.219-23.
- ☐ (15) 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (APR 2008) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- ☐ (16) 52.219-26, Small Disadvantaged Business Participation Program--Incentive Subcontracting (OCT 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- ☐ (17) 52.219-27, Notice of Total Service-Disabled Veteran-Owned Small Business Set-Aside (MAY 2004) (U.S.C. 657 f).
- ☒ (18) 52.219-28, Post Award Small Business Program Rerepresentation (APR 2009) (15 U.S.C. 632(a)(2)).
- ☒ (19) 52.222-3, Convict Labor (JUNE 2003) (E.O. 11755).

☒ (20) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (AUG 2009) (E.O. 13126).

☒ (21) 52.222-21, Prohibition of Segregated Facilities (FEB 1999).

☒ (22) 52.222-26, Equal Opportunity (MAR 2007) (E.O. 11246).

☐ (23) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2006) (38 U.S.C. 4212).

☒ (24) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).

☐ (25) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2006) (38 U.S.C. 4212).

☐ (26) 52.222-54, Employment Eligibility Verification (JAN 2009). (Executive Order 12989). (Not applicable to the acquisition of commercially available off-the-shelf items or certain other types of commercial items as prescribed in 22.1803.)

☐ (27) (i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Items (MAY 2008) (42 U.S.C. 6962(c)(3)(A)(ii)). (Not applicable to the acquisition of commercially available off-the-shelf items.)

☐ (ii) Alternate I (MAY 2008) of 52.223-9 (42 U.S.C. 6962(i)(2)(c)). (Not applicable to the acquisition of commercially available off-the-shelf items.)

☐ (28) 52.223-15, Energy Efficiency in Energy-Consuming Products (DEC 2007) (42 U.S.C. 8259b)

☐ (29)(i) 52.223-16, IEEE 1680 Standard for the Environmental Assessment of Personal Computer Products (DEC 2007) (E.O. 13423)

☐ (ii) Alternate I (DEC 2007) of 52.223-16. .

☐ (30) 52.225-1, Buy American Act--Supplies (JUNE 2003) (41 U.S.C. 10a-10d).

☐ (31)(i) 52.225-3, Buy American Act--Free Trade Agreements--Israeli Trade Act (JUN 2009) (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, 19 U.S.C. 3805 note, Pub. L. 108-77, 108-78, 108-286, 108-302, 109-53, 109-169, 109-283, and 110-138).

☐ (ii) Alternate I (JAN 2004) of 52.225-3.

- \_\_\_ (iii) Alternate II (JAN 2004) of 52.225-3.
- \_\_\_ (32) 52.225-5, Trade Agreements (AUG 2009) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).
- \_\_\_ (33) 52.225-13, Restrictions on Certain Foreign Purchases (JUN 2008) (E.O.'s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).
- \_\_\_ (34) 52.226-4, Notice of Disaster or Emergency Area Set-Aside (Nov 2007) (42 U.S.C. 5150).
- \_\_\_ (35) 52.226-5, Restrictions on Subcontracting Outside Disaster or Emergency Area (Nov 2007) (42 U.S.C. 5150).
- \_\_\_ (36) 52.232-29, Terms for Financing of Purchases of Commercial Items (FEB 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f))
- \_\_\_ (37) 52.232-30, Installment Payments for Commercial Items (OCT 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- \_\_\_X\_\_\_ (38) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (OCT 2003) (31 U.S.C. 3332).
- \_\_\_ (39) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (MAY 1999) (31 U.S.C. 3332)
- \_\_\_ (40) 52.232-36, Payment by Third Party (FEB 2010) (31 U.S.C. 3332).
- \_\_\_ (41) 52.239-1, Privacy or Security Safeguards (AUG 1996) (5 U.S.C. 552a).
- \_\_\_ (42)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631).
- \_\_\_ (ii) Alternate I (APR 2003) of 52.247-64.
- \_\_\_
- (c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)
- \_\_\_ (1) 52.222-41, Service Contract Act of 1965 (Nov 2007) (41 U.S.C. 351, et seq.).



\_\_\_\_ (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

\_\_\_\_ (3) 52.222-43, Fair Labor Standards Act and Service Contract Act--Price Adjustment (Multiple Year and Option Contracts) (SEP 2009) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

\_\_\_\_ (4) 52.222-44, Fair Labor Standards Act and Service Contract Act--Price Adjustment (SEP 2009) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.)

\_\_\_\_ (5) 52.222-51, Exemption from Application of the Service Contract Act to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (Nov 2007) (41 U.S.C. 351, et seq.).

\_\_\_\_ (6) 52.222-53, Exemption from Application of the Service Contract Act to Contracts for Certain Services--Requirements (FEB 2009) (41 U.S.C. 351, et seq.).

\_\_\_\_ (7) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (Mar 2009) (Pub. L. 110-247).

\_\_\_\_ (8) 52.237-11, Accepting and Dispensing of \$1 Coin (SEP 2008)(31 U.S.C. 5112(p)(1)).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) (1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in this paragraph (e)(1) in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause—

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (APR 2010) (Pub. L. 110-252, Title VI, Chapter 1 (41 U.S.C. 251 note).

(ii) 52.219-8, Utilization of Small Business Concerns (May 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$550,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(iii) Reserved.

(iv) 52.222-26, Equal Opportunity (MAR 2007) (E.O. 11246).

(v) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (SEP 2006) (38 U.S.C. 4212).

(vi) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(vii) Reserved.

(viii) 52.222-41, Service Contract Act of 1965 (Nov 2007) (41 U.S.C. 351, et seq.).

(ix) 52.222-50, Combating Trafficking in Persons (FEB 2009) (22 U.S.C. 7104(g)).

Alternate I (AUG 2007) of 52.222-50 (22 U.S.C. 7104(g)).

(x) 52.222-51, Exemption from Application of the Service Contract Act to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (Nov 2007) (41 U.S.C. 351, et seq.).

(xi) 52.222-53, Exemption from Application of the Service Contract Act to Contracts for Certain Services--Requirements (FEB 2009) (41 U.S.C. 351, et seq.).

(xii) 52.222-54, Employment Eligibility Verification (JAN 2009).

(xiii) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations. (MAR 2009) (Pub. L. 110-247). Flow down required in accordance with paragraph (e) of FAR clause 52.226-6.

(xiv) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the contractor May include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(End of clause)

## 252.211-7003 ITEM IDENTIFICATION AND VALUATION (AUG 2008)

(a) Definitions. As used in this clause'

Automatic identification device means a device, such as a reader or interrogator, used to retrieve data encoded on machine-readable media.

Concatenated unique item identifier means--

(1) For items that are serialized within the enterprise identifier, the linking together of the unique identifier data elements in order of the issuing agency code, enterprise identifier, and unique serial number within the enterprise identifier; or

(2) For items that are serialized within the original part, lot, or batch number, the linking together of the unique identifier data elements in order of the issuing agency code; enterprise identifier; original part, lot, or batch number; and serial number within the original part, lot, or batch number.

Data qualifier means a specified character (or string of characters) that immediately precedes a data field that defines the general category or intended use of the data that follows.

DoD recognized unique identification equivalent" means a unique identification method that is in commercial use and has been recognized by DoD. All DoD recognized unique identification equivalents are listed at [http://www.acq.osd.mil/dpap/pdi/uid/iuid\\_equivalents.html](http://www.acq.osd.mil/dpap/pdi/uid/iuid_equivalents.html).

DoD unique item identification means a system of marking items delivered to DoD with unique item identifiers that have machine-readable data elements to distinguish an item from all other like and unlike items. For items that are serialized within the enterprise identifier, the unique item identifier shall include the data elements of the enterprise identifier and a unique serial number. For items that are serialized within the part, lot, or batch number within the enterprise identifier, the unique item identifier shall include the data elements of the enterprise identifier; the original part, lot, or batch number; and the serial number.

Enterprise means the entity (e.g., a manufacturer or vendor) responsible for assigning unique item identifiers to items.

Enterprise identifier means a code that is uniquely assigned to an enterprise by an issuing agency.

Government's unit acquisition cost means--

(1) For fixed-price type line, subline, or exhibit line items, the unit price identified in the contract at the time of delivery;

(2) For cost-type or undefinitized line, subline, or exhibit line items, the Contractor's estimated fully burdened unit cost to the Government at the time of delivery; and

(3) For items produced under a time-and-materials contract, the Contractor's estimated fully burdened unit cost to the Government at the time of delivery.

Issuing agency means an organization responsible for assigning a non-repeatable identifier to an enterprise (i.e., Dun & Bradstreet's Data Universal Numbering System (DUNS) Number, GSI Company Prefix, or Defense Logistics Information System (DLIS) Commercial and Government Entity (CAGE) Code).

Issuing agency code means a code that designates the registration (or controlling) authority for the enterprise identifier.

Item means a single hardware article or a single unit formed by a grouping of subassemblies, components, or constituent parts.

Lot or batch number means an identifying number assigned by the enterprise to a designated group of items, usually referred to as either a lot or a batch, all of which were manufactured under identical conditions.

Machine-readable means an automatic identification technology media, such as bar codes, contact memory buttons, radio frequency identification, or optical memory cards.

Original part number means a combination of numbers or letters assigned by the enterprise at item creation to a class of items with the same form, fit, function, and interface.

Parent item means the item assembly, intermediate component, or subassembly that has an embedded item with a unique item identifier or DoD recognized unique identification equivalent.

Serial number within the enterprise identifier means a combination of numbers, letters, or symbols assigned by the enterprise to an item that provides for the differentiation of that item from any other like and unlike item and is never used again within the enterprise.

Serial number within the part, lot, or batch number means a combination of numbers or letters assigned by the enterprise to an item that provides for the differentiation of that item from any other like item within a part, lot, or batch number assignment.

Serialization within the enterprise identifier means each item produced is assigned a serial number that is unique among all the tangible items produced by the enterprise and is never used again. The enterprise is responsible for ensuring unique serialization within the enterprise identifier.

Serialization within the part, lot, or batch number means each item of a particular part, lot, or batch number is assigned a unique serial number within that part, lot, or batch number assignment. The enterprise is responsible for ensuring unique serialization within the part, lot, or batch number within the enterprise identifier.

Unique item identifier means a set of data elements marked on items that is globally unique and unambiguous. The term includes a concatenated unique item identifier or a DoD recognized unique identification equivalent.

Unique item identifier type means a designator to indicate which method of uniquely identifying a part has been used. The current list of accepted unique item identifier types is maintained at [http://www.acq.osd.mil/dpap/pdi/uid/uii\\_types.html](http://www.acq.osd.mil/dpap/pdi/uid/uii_types.html).

(b) The Contractor shall deliver all items under a contract line, subline, or exhibit line item.

(c) Unique item identifier.

(1) The Contractor shall provide a unique item identifier for the following:

(i) All delivered items for which the Government's unit acquisition cost is \$5,000 or more.

(ii) The following items for which the Government's unit acquisition cost is less than \$5,000:

-----  
Contract line, subline, or exhibit line

item No.

Item description  
-----

N/A

(iii) Subassemblies, components, and parts embedded within delivered items as specified in Attachment Number ----.

(2) The unique item identifier and the component data elements of the DoD unique item identification shall not change over the life of the item.

(3) Data syntax and semantics of unique item identifiers. The Contractor shall ensure that--

(i) The encoded data elements (except issuing agency code) of the unique item identifier are marked on the item using one of the following three types of data qualifiers, as determined by the Contractor:

(A) Application Identifiers (AIs) (Format Indicator 05 of ISO/IEC International Standard 15434), in accordance with ISO/IEC International Standard 15418, Information Technology--EAN/UCC Application Identifiers and Fact Data Identifiers and Maintenance and ANSI MH 10.8.2 Data Identifier and Application Identifier Standard.

(B) Data Identifiers (DIs) (Format Indicator 06 of ISO/IEC International Standard 15434), in accordance with ISO/IEC International Standard 15418, Information Technology--EAN/UCC Application Identifiers and Fact Data Identifiers and Maintenance and ANSI MH 10.8.2 Data Identifier and Application Identifier Standard.

(C) Text Element Identifiers (TEIs) (Format Indicator 12 of ISO/IEC International Standard 15434), in accordance with the Air Transport Association Common Support Data Dictionary; and

(ii) The encoded data elements of the unique item identifier conform to the transfer structure, syntax, and coding of messages and data formats specified for Format Indicators 05, 06, and 12 in ISO/IEC International Standard 15434, Information Technology--Transfer Syntax for High Capacity Automatic Data Capture Media.

(4) Unique item identifier.

(i) The Contractor shall--

(A) Determine whether to--

(1) Serialize within the enterprise identifier;

(2) Serialize within the part, lot, or batch number; or

(3) Use a DoD recognized unique identification equivalent; and

(B) Place the data elements of the unique item identifier (enterprise identifier; serial number; DoD recognized unique identification equivalent; and for serialization within the part, lot, or batch number only: original part, lot, or batch number) on items requiring marking by paragraph (c)(1) of this clause, based on the criteria provided in the version of MIL-STD-130, Identification Marking of U.S. Military Property, cited in the contract Schedule.

(ii) The issuing agency code--

(A) Shall not be placed on the item; and

(B) Shall be derived from the data qualifier for the enterprise identifier.

(d) For each item that requires unique item identification under paragraph (c)(1)(i) or (ii) of this clause, in addition to the information provided as part of the Material Inspection and Receiving Report specified elsewhere in this contract, the Contractor shall report at the time of delivery, either as part of, or associated with, the Material Inspection and Receiving Report, the following information:

(1) Unique item identifier.

(2) Unique item identifier type.

(3) Issuing agency code (if concatenated unique item identifier is used).

(4) Enterprise identifier (if concatenated unique item identifier is used).

- (5) Original part number (if there is serialization within the original part number).
- (6) Lot or batch number (if there is serialization within the lot or batch number).
- (7) Current part number (optional and only if not the same as the original part number).
- (8) Current part number effective date (optional and only if current part number is used).
- (9) Serial number (if concatenated unique item identifier is used).
- (10) Government's unit acquisition cost.
- (11) Unit of measure.

(e) For embedded subassemblies, components, and parts that require DoD unique item identification under paragraph (c)(1)(iii) of this clause, the Contractor shall report as part of, or associated with, the Material Inspection and Receiving Report specified elsewhere in this contract, the following information:

- (1) Unique item identifier of the parent item under paragraph (c)(1) of this clause that contains the embedded subassembly, component, or part.
- (2) Unique item identifier of the embedded subassembly, component, or part.
- (3) Unique item identifier type.\*\*
- (4) Issuing agency code (if concatenated unique item identifier is used).\*\*
- (5) Enterprise identifier (if concatenated unique item identifier is used).\*\*
- (6) Original part number (if there is serialization within the original part number).\*\*
- (7) Lot or batch number (if there is serialization within the lot or batch number).\*\*
- (8) Current part number (optional and only if not the same as the original part number).\*\*
- (9) Current part number effective date (optional and only if current part number is used).\*\*
- (10) Serial number (if concatenated unique item identifier is used).\*\*
- (11) Description.

\*\* Once per item.

(f) The Contractor shall submit the information required by paragraphs (d) and (e) of this clause in accordance with the data submission procedures at [http://www.acq.osd.mil/dpap/pdi/uid/data\\_submission\\_information.html](http://www.acq.osd.mil/dpap/pdi/uid/data_submission_information.html).

(g) Subcontracts. If the Contractor acquires by subcontract, any item(s) for which unique item identification is required in accordance with paragraph (c)(1) of this clause, the Contractor shall include this clause, including this paragraph (g), in the applicable subcontract(s).

(End of clause)

252.212-7001 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS APPLICABLE TO DEFENSE ACQUISITIONS OF COMMERCIAL ITEMS (APR 2010)

(a) The Contractor agrees to comply with the following Federal Acquisition Regulation (FAR) clause which, if checked, is included in this contract by reference to implement a provision of law applicable to acquisitions of commercial items or components.

\_\_\_ 52.203-3, Gratuities (APR 1984) (10 U.S.C. 2207).

(b) The Contractor agrees to comply with any clause that is checked on the following list of Defense FAR Supplement clauses which, if checked, is included in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items or components.

(1) \_\_\_ 252.203-7000, Requirements Relating to Compensation of Former DoD Officials (JAN 2009) (Section 847 of Pub. L. 110-181).

(2) \_\_\_ 252.205-7000, Provision of Information to Cooperative Agreement Holders (DEC 1991) (10 U.S.C. 2416).

(3) \_\_\_ 252.219-7003, Small Business Subcontracting Plan (DoD Contracts) (APR 2007) (15 U.S.C. 637).

(4) \_\_\_ 252.219-7004, Small Business Subcontracting Plan (Test Program) (AUG 2008) (15 U.S.C. 637 note).

(5) X 252.225-7001, Buy American Act and Balance of Payments Program (JAN 2009) (41 U.S.C. 10a-10d, E.O. 10582).

(6) \_\_\_ 252.225-7008, Restriction on Acquisition of Specialty Metals (JUL 2009) (10 U.S.C. 2533b).

(7) \_\_\_ 252.225-7009, Restriction on Acquisition of Certain Articles Containing Specialty Metals (JUL 2009) (10 U.S.C. 2533b).

(8) \_\_\_ 252.225-7012, Preference for Certain Domestic Commodities (DEC 2008) (10 U.S.C. 2533a).

(9) \_\_\_ 252.225-7015, Restriction on Acquisition of Hand or Measuring Tools (JUN 2005) (10 U.S.C. 2533a).

(10) \_\_\_ 252.225-7016, Restriction on Acquisition of Ball and Roller Bearings (MAR 2006) (Section 8065 of Public Law 107-117 and the same restriction in subsequent DoD appropriations acts).

(11) (i) \_\_\_ 252.225-7021, Trade Agreements (NOV 2009) (19 U.S.C. 2501-2518 and 19 U.S.C. 3301 note).

(ii) \_\_\_ Alternate I (SEP 2008)

(12) \_\_\_ 252.225-7027, Restriction on Contingent Fees for Foreign Military Sales (APR 2003) (22 U.S.C. 2779).

(13) \_\_\_ 252.225-7028, Exclusionary Policies and Practices of Foreign Governments (APR 2003) (22 U.S.C. 2755).



(14)(i) \_\_\_\_ 252.225-7036, Buy American Act--Free Trade Agreements--Balance of Payments Program (JUL 2009) (41 U.S.C. 10a-10d and 19 U.S.C. 3301 note).

(ii) \_\_\_\_ Alternate I (JUL 2009) of 252.225-7036.

(15) \_\_\_\_ 252.225-7038, Restriction on Acquisition of Air Circuit Breakers (JUN 2005) (10 U.S.C. 2534(a)(3)).

(16) \_\_\_\_ 252.226-7001, Utilization of Indian Organizations, Indian-Owned Economic Enterprises, and Native Hawaiian Small Business Concerns (SEP 2004) (Section 8021 of Public Law 107-248 and similar sections in subsequent DoD appropriations acts).

(17) \_\_\_\_ 252.227-7015, Technical Data--Commercial Items (NOV 1995) (10 U.S.C. 2320).

(18) \_\_\_\_ 252.227-7037, Validation of Restrictive Markings on Technical Data (SEP 1999) (10 U.S.C. 2321).

(19)   X   252.232-7003, Electronic Submission of Payment Requests and Receiving Reports (MAR 2008) (10 U.S.C. 2227).

(20) \_\_\_\_ 252.237-7019, Training for Contractor Personnel Interacting with Detainees (SEP 2006) (Section 1092 of Public Law 108-375).

(21) \_\_\_\_ 252.243-7002, Requests for Equitable Adjustment (MAR 1998) (10 U.S.C. 2410).

(22) \_\_\_\_ 252.247-7003, Pass-Through of Motor Carrier Fuel Surcharge Adjustment to the Cost Bearer (JUL 2009) (Section 884 of Public Law 110-417).

(23)(i) \_\_\_\_ 252.247-7023, Transportation of Supplies by Sea (MAY 2002) (10 U.S.C. 2631).

(ii) \_\_\_\_ Alternate I (MAR 2000) of 252.247-7023.

(iii) \_\_\_\_ Alternate II (MAR 2000) of 252.247-7023.

(iv) \_\_\_\_ Alternate III (MAY 2002) of 252.247-7023.

(24) \_\_\_\_ 252.247-7024, Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

(c) In addition to the clauses listed in paragraph (e) of the Contract Terms and Conditions Required to Implement Statutes or Executive Orders--Commercial Items clause of this contract (FAR 52.212-5), the Contractor shall include the terms of the following clauses, if applicable, in subcontracts for commercial items or commercial components, awarded at any tier under this contract:

(1) 252.237-7019, Training for Contractor Personnel Interacting with Detainees (SEP 2006) (Section 1092 of Public Law 108-375).

(2) 252.247-7003, Pass-Through of Motor Carrier Fuel Surcharge Adjustment to the Cost Bearer (JUL 2009) (Section 884 of Public Law 110-417).

(3) 252.247-7023, Transportation of Supplies by Sea (MAY 2002) (10 U.S.C. 2631).

(4) 252.247-7024, Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

(End of clause)

### USMC WIDE AREA WORKFLOW IMPLEMENTATION (MAR 2010)

To implement DFARS 252.232-7003, "ELECTRONIC SUBMISSION OF PAYMENT REQUEST (MAR 2007)", the United States Marine Corps (USMC) utilizes Wide Area WorkFlow-Receipt and Acceptance (WAWF-RA) to electronically process vendor requests for payment. This application allows DoD vendors to submit and track Invoices and Receipt/Acceptance documents electronically.

The contractor is required to utilize this system when processing invoices and receiving reports under this contract/order, unless the provision at DFARS 252.232-7003(c) applies. The contractor shall (i) ensure an Electronic Business Point of Contact is designated in Central Contractor Registration at <http://www.ccr.gov> and (ii) register to use WAWF-RA at the <https://wawf.eb.mil> site, within ten (10) calendar days after award of this contract or modification. For Vendor Registration Assistance and account activation, please contact the DISA Ogden E-Business Help Desk at 1-866-618-5988 option 2. Step by step procedures to register are available at the <https://wawf.eb.mil> site. Training for this application is available at <http://www.wawftraining.com>.

**Notice to Vendors: Delivery of supplies to any address other than the delivery address specified in the contract is not authorized without a contract modification signed by the Contracting Officer. Failure to deliver to the address in the contract will result in rejection of invoices and will cause delay in payment.**

Contract Administrator for this Contract is: Contract Administration Branch, Telephone 910-449-9279

The contractor is directed to use the Combo format when processing invoices and receiving reports.

When entering the invoice into WAWF-RA, the contractor shall fill in the following DoDAAC fields or DoDAAC extensions:

Contract Number	M6700110P1298
Delivery Order	N/A
Cage Code/Ext	3BNE2
Pay DoDAAC	M67443
Issue Date	SEE BLOCK #3
Issue By DoDAAC	M67001
Admin By DoDAAC	M67001
Ship To Code/Ext	M31000
Ship From Code/Ext	3BNE2
LPO DoDAAC	N/A

Acceptor Email Address	Murlene.smith@usmc.mil
Inspect By DoDAAC/Ext	N/A

In some situations the WAWF-RA system will pre-populate the "Issue By DoDAAC", "Admin By DoDAAC" and "Pay DoDAAC". Contractor shall verify those DoDAACs automatically entered by the WAWF-RA system match the above information. If these DoDAACs do not match, then the contractor shall correct the field(s) and notify the Contracting Officer of the discrepancy (ies). Step by step WAWF-RA invoicing procedures for "Combo," "2-in-1," and "Cost Voucher" are available at the USMC paperless site at <http://www.marcorsyscom.usmc.mil/sites/pa/> under "Vendor Interface" section. On the Vendor Interface page click on "WAWF-RA" header at the top of the page. Under downloads on the WAWF-RA page that appears, click the appropriate document either "Combo," "2-in-1," or "Cost Voucher" to download the instructions.

Before closing out of an invoice session in WAWF-RA, but after submitting the document or documents, the contractor will be prompted to send additional email notifications. Contractor shall click on "Send More Email Notification" on the page that appears. Add the acceptor's/receiver's email address [Murlene.smith@usmc.mil](mailto:Murlene.smith@usmc.mil) and [stella.butler@usmc.mil](mailto:stella.butler@usmc.mil) (Note this address is their work email address not their WAWF-RA organizational email address) in the first email address block and add any other additional email addresses desired in the following blocks. This additional notification to the Government is important to ensure the acceptor/receiver is aware that the invoice documents have been submitted into the WAWF-RA system.

NOTE: The POCs identified above are for WAWF-RA issues only. Any other contracting questions/problems should be addressed to the Contracting Officer or Contract Administrator identified in the contract to whom questions are to be addressed.

(End of clause)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				I. CONTRACT ID CODE J	PAGE OF PAGES 1   3	
2. AMENDMENT/MODIFICATION NO. P00001		3. EFFECTIVE DATE 12-Oct-2010		4. REQUISITION/PURCHASE REQ. NO. M9317710SU00149		5. PROJECT NO. (If applicable)
6 ISSUED BY CONTRACTING DEPARTMENT ATTN: CONTRACT ADMINISTRATION PHONE: (910) 451-1457 P.O. BOX 8368 MCB CAMP LEJEUNE NC 28547		CODE M67001	7 ADMINISTERED BY (If other than item 6) CONTRACTING DEPARTMENT ATTN: CONTRACT ADMINISTRATION PHONE: (910) 449-9279 P.O. BOX 8368 MCB CAMP LEJEUNE NC 28547		CODE M67001	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code) UAV PRO INC JAY WILLMOTT 873 W PARADE AVE BLACKSTONE VA 23824-0430				9A. AMENDMENT OF SOLICITATION NO.		
				9B. DATED (SEE ITEM 11)		
				X	10A. MOD. OF CONTRACT/ORDER NO. M67001-10-P-1298	
				X	10B. DATED (SEE ITEM 13) 15-Jun-2010	
CODE 3BNE2		FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS						
<input type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
12. ACCOUNTING AND APPROPRIATION DATA (If required)						
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT/ORDERS IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.						
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.						
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).						
X C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: FAR 52.212-4(c)						
D. OTHER (Specify type of modification and authority)						
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input checked="" type="checkbox"/> is required to sign this document and return <u>1</u> copies to the issuing office.						
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Modification Control Number: makinson1119 THIS MODIFICATION IS ISSUED TO EXTEND THE DELIVERY DATE 60 DAYS. POC: JANICE MAKINSON, (910) 450-5019						
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.						
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) JOSHUA K WELLS / PURCHASING AGENT TEL 910-451-1724 EMAIL joshua.kwells1@smc.mil			
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY <u>Joshua K Wells</u> (Signature of Contracting Officer)		16C. DATE SIGNED 29-Oct-2010

EXCEPTION TO SF 30  
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)  
Prescribed by GSA  
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES  
SECTION SF 1449 - CONTINUATION SHEET

DELIVERIES AND PERFORMANCE

The following Delivery Schedule item for CLIN 0001 has been changed from:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
07-SEP-2010	2	OPERATIONS AND TRAINING DEPARTMENT LISA A. GRAY BLDG 56 POST LANE CAMP LEJEUNE NC 28547 451-8905 FOB: Destination	M93177

To:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
15-NOV-2010	2	OPERATIONS AND TRAINING DEPARTMENT LISA A. GRAY BLDG 56 POST LANE CAMP LEJEUNE NC 28547 451-8905 FOB: Destination	M93177

The following Delivery Schedule item for CLIN 0002 has been changed from:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
07-SEP-2010	2	OPERATIONS AND TRAINING DEPARTMENT LISA A. GRAY BLDG 56 POST LANE CAMP LEJEUNE NC 28547 451-8905 FOB: Destination	M93177

To:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
15-NOV-2010	2	OPERATIONS AND TRAINING DEPARTMENT LISA A. GRAY BLDG 56 POST LANE CAMP LEJEUNE NC 28547 451-8905 FOB: Destination	M93177

(End of Summary of Changes)

NKT-VMU2 GBSAA Letter of Agreement of Oct 23, 2012,  
withheld in its entirety under exemption (b)(2),  
enclosure (3).

Enclosure (3)

Enclosure (4)



# *Cherry Point Ground Based Sense and Avoid (GBSAA) Approval Plan*



**Version 0.0  
January 26, 2011**

Prepared by:  
**PMA 262 Airspace Integration**

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**REVISION HISTORY**

<b>Version</b>	<b>Date</b>	<b>Description of Change</b>
0.0	26 Jan 2011	Initial document and template.

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## 1 PURPOSE

This approval plan establishes the information needed by the NAVAIR and user community stakeholders to affect a timely and complete review of the artifacts and data developed in support of operational approval of a Ground Based Sense and Avoid (GBSAA) capability at MCAS Cherry Point, NC. Information provided includes identification of the subject matter experts (SME) required to evaluate the system, establishment of review boundaries for each SME, processes/tools to be used for review and concurrence, and a schedule of activities. It is expected that the document will be routinely updated throughout the approval process and should serve as a communications tool to all stakeholders. Any and all questions regarding the information in this document should be directed to the PMA 262 Airspace Integration Team.

## 2 INTRODUCTION

Marine Unmanned Aerial Vehicle Squadron Two (VMU2) has a critical need to operate out of MCAS Cherry Point to train and qualify Unmanned Aircraft System (UAS) operators in preparation for deployment to Iraq and Afghanistan. To date, this training has been conducted at MCAS Cherry Point under the jurisdiction of the MCAS Cherry Point Air Traffic Control Tower and Cherry Point Approach Control, in accordance with a Federal Aviation Administration (FAA) Certificate of Authorization (COA). This COA has expired on March 2008. Consequently, VMU2 training is limited to operations out of Bogue Field, a remote airstrip located within the restricted area. The logistics associated with operation from this remote site however, creates an unacceptable reduction in available training time and ultimately, readiness.

Recognizing the importance of operating out of MCAS Cherry Point, the Office of Secretary of Defense (OSD) funded a Concept Demonstration effort for VMU2 operations out of MCAS Cherry Point. This Concept Demonstration is the GBSAA system and it is the key element in the Marines application for a renewed COA. This GBSAA system was developed by the PMA-262 Airspace Integration GBSAA Team as a solution for UAS transit from MCAS to the VMU2 training areas. As a new technology, GBSAA is subject to both NAVAIR's approval process and the FAA COA process before being utilized in an operational setting.

## 3 STAKEHOLDERS

- Office of Secretary of Defense (OSD)
- United States Marine Corps Headquarters Marine Corps Deputy Commandant Aviation
- United States Marine Corps MCI East
- United States Marine Corps Marine Unmanned Aerial Vehicle Squadron Two (VMU 2)
- Marine Corp Air Station Cherry Point Air Traffic Control
- NAVAIR Technical Subject Matter Experts (All applicable competencies)
- PMA 262 Airspace Integration Team
- PMA 263 Navy and Marine Corps Small Tactical Unmanned Aircraft Systems
- PMA 213 Air Traffic Management Systems



- US Army (UAS USAIC Program Development Office)

## 4 SYSTEMS INTEGRATION DESCRIPTIONS

### 4.1 Concept of Employment (ConEmp)

The Cherry Point GBSAA Concept of Employment (ConEmp) describes the demonstration effort to use ground-based radar in conjunction with other risk mitigations to establish a safe method to replace visual ground observers for the Shadow UAS transit within Class E airspace. The concept incorporates strategies that build upon several years of Cherry Point MCAS UAS operations, and utilizes pre-existing Air Traffic Management (ATM) systems to improve the operational view for both controllers and pilots. The operational view graphic is below.

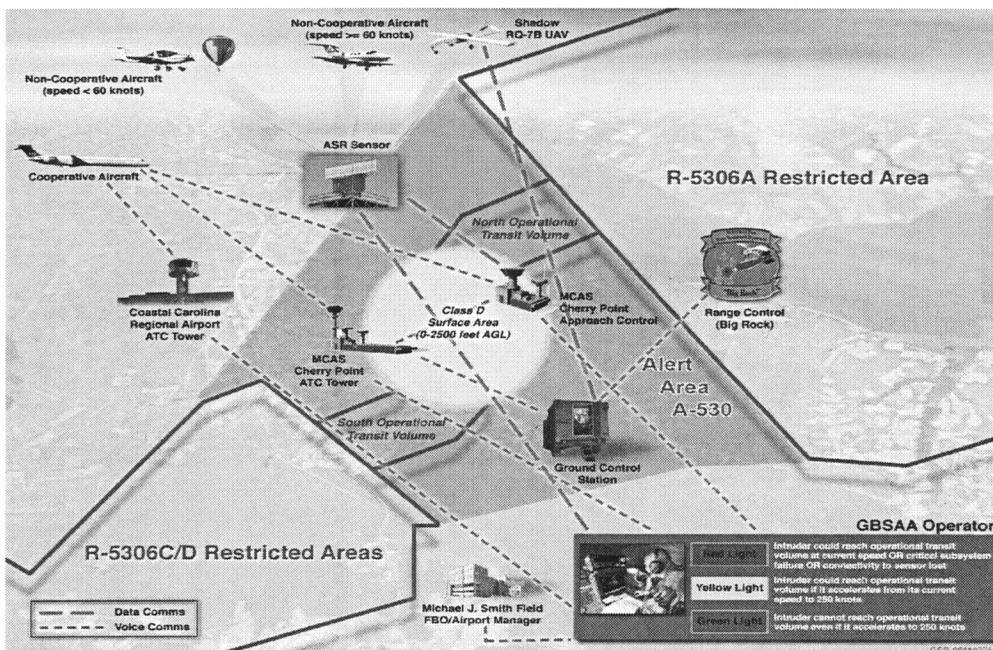


FIGURE 1. OV-1 FOR MCAS CHERRY POINT SHADOW RQ-7B UAS CURRENT OPERATIONS

The ConEmp specifically addresses the flight of the UAS through the national airspace system while enroute to and from the restricted areas used for flight training. It presents a method of UAS operation and a proposed GBSAA operator system to establish enhanced aircraft separation while establishing zero conflict airspace (ZCA), thus allowing the UA to safely transit without concern for conflicts with intruder aircraft.

The successful completion of this concept demonstration will epitomize initial steps towards NAS access for Unmanned Aircraft. It is recommended that suitability be determined by a final

safety assessment, supporting analysis and the NAVAIR Subject Matter Expert (SME) team's independent concurrence.

## 4.2 System Requirements

The Cherry Point GBSAA system requirements documented in the Marine Corps Air Station (MCAS) Cherry Point Shadow Ground Based Sense and Avoid (GBSAA) Requirements, Version 2.0 document (GSC05) were developed based on the GBSAA Concept of Employment (CONEMP). These requirements are specific to the Cherry Point GBSAA solution to UAS airspace integration and do not address Shadow or Air Traffic Control (ATC) requirements, which can be found in the specifications for those systems. Although system requirements were included for the GBSAA sensor, those requirements were not used to drive requirements onto the sensor system. Instead, they were used to confirm that the chosen sensor system met the needs of the GBSAA system to implement the CONEMP for safe UA operations at Cherry Point.

The system requirements were written based on inputs from Cherry Point stakeholders, including the Marine Corps FAA Liaison Officer, MCAS Cherry Point ATC, PMA-262, Stand Alone Radar CONsole (STARCON) developers, test leads, safety leads, the CONEMP author, and the architecture leads. Requirements workshops to review and update the requirements were held with the stakeholders in October and November 2009, with a formal review held in November 2009. Safety Workshops and reviews were held in January and May 2010. Additional modifications were made resulting from a pre-test meeting and Factory Acceptance Testing (FAT) in June 2010 and Operational Site Acceptance Testing (OSAT) in July 2010. Baseline 1.0 of the system requirements document has been approved and signed by PMA-262. Baseline 2.0 of the system requirements has been approved by PMA-262 and is awaiting signature. All of the requirements and requirement attributes are managed in IBM Rational® DOORS®.

The structure of the system requirements follows MIL-STD-961E "Department of Defense Standard Practice Defense and Program-Unique Specifications Format and Content." Section One describes the scope and overview of the Cherry Point GBSAA, including assumptions and a concept description. Section Two lists the reference documents applicable to these requirements. Section Three contains the actual requirements written as "shall" statements. Section Four describes the methods used to verify the requirements. Section Five includes definitions of the terms used in the document, such as Surveillance Volume, Coasting, Intruder, and Threat Aircraft. The requirements have attribute columns for test method, test event, applicable subsystem (alerting or tracking), safety criticality (yes or no), operations and procedures applicable (yes or no), trace to the GBSAA Software Requirements, and applicable architecture Operational Activity (OA) from the Operational View (OV)-5, Information Data Exchange from the Systems View (SV)-1, and System Function (SF) from the SV-1. Additional information on the architecture can be found in the Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Architecture document (GSC18).

System requirements were decomposed into software requirements documented in 4583-D2010006 Software Requirements Specification Document, v1.2. A top down trace from the system requirements to the software requirements was conducted and is maintained as an attribute in DOORS®. A bottoms-up trace from the software requirements to the system requirements was completed and documented in the 4583-D2010011 Software Requirements



Traceability Matrix, v1.1.

### 4.3 System Architecture

Based on the overall concept described in the Cherry Point GBSAA CONEMP, a set of operational and system architecture products that represent the intended operations were produced. The architecture represents a more detailed breakdown of the operational concept described in the CONEMP, describing the key set of components (both humans and systems), what they do, how they relate to one another, and the rules and constraints under which they function. It is meant to serve as high level design documentation that utilizes a framework that is well understood by both the DoD and FAA. It also provides technical content for the following safety case artifacts: CONEMP, Requirements, Operations and Procedures, Timeline Analysis, and Safety Argument. It ensures that all relevant details of the proposed operations are documented and it helps ensure consistency between safety case artifacts. The architecture was developed in accordance with the "Department of Defense Architecture Framework (DoDAF) Version 1.5, 23 April 2007."

The architecture development effort initiated with a detailed survey used to gather data on how operations are currently performed. Based on the results of this survey, an MCAS Cherry Point Current Operations Architecture document (AI-T1004e) was produced to document current Cherry Point UAS operations based on the approved COA (2008-ESA-39) and MCAS Cherry Point ATC Facility VMU-2 Letter of Procedure (LOP) (07 February 2008). This architecture document was completed and approved by PMA-262 and MCAS Cherry Point ATC in August/September 2009. Using this Current Operations Architecture as a starting point, a Future Operations Architecture document (GSC18) was produced that depicts specific changes required for a GBSAA solution meant to reduce current restrictions for flying in non-segregated airspace within the NAS.

In order to determine which architecture views to produce, the "DoD Architecture Framework Version 1.5, Volume 1: Definitions and Guidelines" was referenced. Figure 3-1 in this document depicts applicable architecture products to generate based on the overall need, which in this case is support of Operational Planning. As such, the following were the specific architecture artifacts produced:

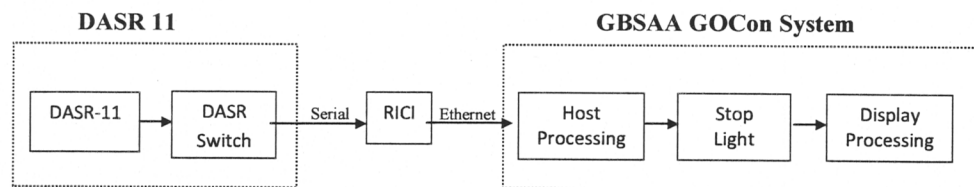
- OV-1: High-Level Operational Concept Graphic. Provides a quick, high-level description of what the architecture is supposed to do, and how it is supposed to do it.
- OV-2: Operational Node Connectivity Description. Indicates the key players and the interactions necessary to conduct the corresponding operational activities.
- OV-4: Organizational Relationships Chart. Depicts the relationships among the key players in the architecture.
- OV-5: Operational Activity Model. A time-ordered depiction of all of the activities required to accomplish the UAS mission. In order to break down operations to a more manageable set of diagrams, five use cases were produced that resulted in the following five OV-5 diagrams:
  - Takeoff and Departure
  - Assess Readiness to Transit

- Transition to/from Restricted Areas
- Manage Contingencies
- Land and Shutdown
- SV-1: Systems Interface Description. Depicts system nodes and the systems/system functions resident at these nodes to support the operational activities and operational nodes.
- AV-1: Overview and Summary Information. Provides background on the architecture project including the project description, scope, viewpoint, purpose, and context.
- AV-2: Integrated Dictionary. Defines all of the terms used within the architecture.
- SV-10c: System Event-Trace Description. Depicts time-ordered data exchanges for establishing tracks and assigning threat values.

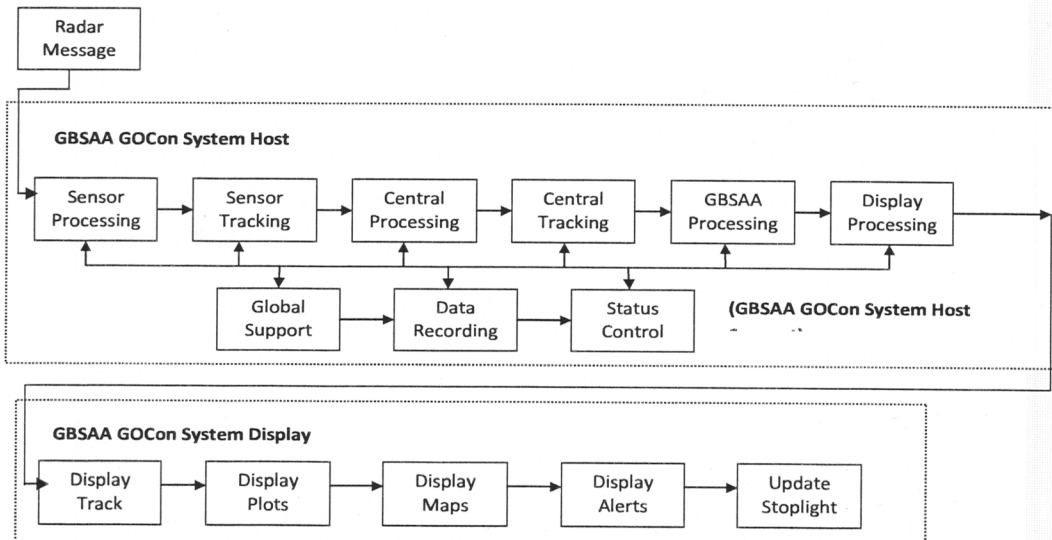
The final MCAS Cherry Point Future Operations Architecture document (GSC18) was completed and approved by PMA-262 in July 2010.

#### 4.3.1 Software GBSAA Display System Components

GBSAA GOCon System Diagram (OVERVIEW)



#### External Sensor Data



**GBSAA GOCon Host Processing**

- **Sensor Processing**
  - Receive Radar Message
  - Validate Message
  - Decode Message
  - Create Target (Beacon, Primary, etc)
- **Sensor Tracking**
  - Create/Correlate Beacon Sensor Track
  - Create/Correlate Primary Track
  - Forward Sensor Tracks/Plots to Central Processing
- **Central Processing**
  - Collect Tracks from Sensors (GBSAA is single sensor)
  - Collect Plots from Sensors (GBSAA is single sensor)
- **Central Tracking**
  - Combine Tracks from Sensors (GBSAA is single sensor)
  - Forward Tracks to GBSAA Processing
  - Forward Plots to Display Processing
- **GBSAA Processing**
  - UAV Track Evaluation
  - Discrete Track Evaluation (Forward to Display)
  - Non-Discrete Evaluation
    - Exclusion Processing (List or Area)
    - Mode 2 Evaluation (Mode 2 = cooperative)
  - Primary Track Processing
  - Threat Evaluation
    - Evaluate non-cooperative tracks
      - Based on ground speed and distance from active OTV.
    - Threat Level Update
      - Red, Yellow, Green
    - Forward Track/Status/Alert to Display Interface
- **Display Interface (Processing)**
  - Update Display Status
  - Send track Update

## 5 NAVAIR SAFETY RISK EVALUATION

NAVAIR is the risk process owner for the GBSAA System in support of VMU-2 Shadow operations at MCAS Cherry Point, NC. Current NAVAIR processes do not address hybrid systems like the GBSAA System. Specifically, there is no basis—similar to that for manned aviation—for ensuring due diligence has been given with regards to safety engineering. A system that is not resident on the air vehicle is critical to safe operations of that air vehicle. The GBSAA program needs NAVAIR subject matter experts to validate the GBSAA program's engineering conclusions sufficiently for NAVAIR to assess the flight and operational safety risk associated with transit operations using the GBSAA.

**Comment [pf1]:** Provide info on the basis for risk evaluation.....NAVAIRINST as tailored from MIL-STD-882. ID the basis for 10E-7 as the baseline

## 6 COMMUNICATIONS PLAN

### 6.1 Approval Authority

AIR-4.1 is the NAVAIR approval authority for the GBSAA System at MCAS Cherry Point. The AIR-4.1 approving official is responsible for ensuring the integrated systems and corresponding procedures are fit for use with acceptable risk as defined in NAVAIRINST XXX, and that adequate sustainment mechanisms are in place to support operations over the defined life-cycle. The AIR-4.1 approval process for the GBSAA, MCAS Cherry Point system, will emulate the NAVAIR 4.0P airworthiness approval processes. To that end, SMEs have been identified to perform a technical review of the engineering conclusions made by the GBSAA program team. The SMEs will review the conclusions, the documentation supporting those conclusions, and to validate or make recommendations to support risk acceptance by NAVAIR decision makers. Program documentation supporting the argument for safety is listed in Appendix A and is available to the SME team. The AIR-4.1 GBSAA, Cherry Point approval letter along with the Shadow Flight Clearance will form the basis for the NAVAIR input to the COA for VMU 2 Shadow operations at MCAS Cherry Point, NC.

### 6.2 SME Roles and Responsibilities

#### 6.2.1 AIR-4.1, Systems Engineering –

The AIR-4.1 Systems Engineering Department is responsible for the review/approval of the Shadow flight clearance, and the GBSAA integrated material and procedural solutions. AIR-4.1 will coordinate the overall review by other disciplines, and will represent NAVAIR on any technical issues associated with COA submission to the FAA.

#### 6.2.2 AIR-4.1.6, System Safety –

The AIR-4.1.6 Division is responsible for the review and concurrence of the system and software safety elements of the GBSAA system.

### 6.2.3 System Safety–

### 6.2.4 Software Safety–

### 6.2.5 Human System –

### 6.2.6 AIR-4.5.5, Radar Engineering –

The AIR-4.5.5 radar engineering division is responsible for evaluating the DASR-11 radar detection and track performance as it pertains to the GBSAA implementation at MCAS Cherry Point. Based on available test data and analysis AIR-4.5.5 will assess the DASR-11's ability to meet or exceed performance requirements for the GBSAA system. Included in this assessment is the concurrence on the DASR-11 performance assumptions associated with the system safety analysis.

### 6.2.7 AIR-5.1.6, Test & Evaluation –

The AIR-5.1.6 T&E division is responsible for the test, evaluation, and documentation of the DASR-11 and GBSAA Operator Console (GOCON) end-to-end performance. Test reports will be incrementally released to provide results of test parameters that are at low risk for changing.

### 6.2.8 4. OP Airworthiness–

## 6.3 NAVAIR Competency Subject Matter Experts (SME)

Name	Competency	Area of expertise	Role
Kracinovich, Steve	4.1.1.5	Systems Engineering	Review/Approval
Frederick, Paul	4.1.1.5	PMA 262- AI APMSE	Review/Concurrence
Parsons, Wayne	4.1.1.5	PMA263 Chief Engineer	Review/Concurrence
Richman, Marcus	4.1.1.5	Shadow APMSE	Review/Concurrence



Name	Competency	Area of expertise	Role
Meyerhoff, Curt	4.6	Human Systems	Review/Approval/Concurrence
Zidzik, Jim	4.1.6	System Safety	Review/Approval/Concurrence
Zrebiec, Don	4.1.6	System Safety	Review/ Concurrence
Gill, Janet	4.1.6	Software safety	Review/Approve/Concurrence
Zwissler, Bob	4.1.6	Software safety	Review/Concurrence
Pearce, Doug	AIR-09F/5.0F	NAVAIR Safety	Review/Concurrence
LT Abbott, Brian	Naval Safety	Navy Safety Center	Review/Concurrence
Allen, Ollie	4.5.5	Radar-DASR	Review/Approval/Concurrence
TBD	4.5	ATC	Review/Approval/Concurrence
Carroll, Walter	PMA 213	ATC	Review/Concurrence
Roberts, Dave	5.1.6	Test and Evaluation	Review/Approval/Concurrence
Hanley, Bob	4.0P	Airworthiness	Review/Concurrence
Slade, Chuck	4.0P	Airworthiness	Review/Concurrence
LtCol Macone	USMC	FAA Liaison	Review/Concurrence
MAJ White, Brad	USMC	Cherry Point ATC	Review/Concurrence
MAJ Burgess	USMC	Cherry Point VMU2	Review/Concurrence

#### 6.4 Review and Approval Process Tool

Background: The Test Management and Reporting Tool (TMRT) is an "e-power based" software application that has defined workflow for reviewing, managing and archiving documents. TMRT provides a NAVAIR document repository via the Hummingbird application. The repository will provide configuration control of the documents, allowing common, but controlled, access as determined by the document owner. Uploaded documents are backed up nightly at 7.2 (IMD). This tool was developed for AIR 5.1 Test & Evaluation (T&E), primarily for flight test planning. TMRT also includes a generic Corporate Process that can be tailored to the needs of the user, by the user. The TMRT Corporate Process has no formal workflow defined, but does have an in-depth ad-hoc workflow capability to allow users to define their review processes on the fly.

In addition to the SharePoint repository currently used by the team, the Cherry Point Ground Base Sense and Avoid (GBSAA) approval process will also utilize the TMRT Corporate Routing process as a collaborative and communication tool amongst the SMEs and Team Leads. Document leads will create the workflow for the SMEs and Team Leads to work on their specific documents or parts of a document. Notes can be posted in the document folder to aid collaboration and discussion amongst the members. The repository tracks the revisions of each document so going back to a previous version is easy. With the most current copy always available and in a consistent location, team members will be working from the same version.

**User Roles and Responsibilities:** Appropriate access privileges will be given to users according to each area of involvement. Using a Common Access Card (CAC), users will be assigned an account. Also, users will be required to take training depending on his/her role. Training can be taken online or can be scheduled with the TMRT team.

<https://teamworkflow.navair.navy.mil/epwfactivator/>

## 7 SME REVIEW TASKS

Name	TEAM POC	REFERENCE MATEREIAL	BASIS FOR APPROVAL
Kracinovich, Steve	Kevin Warren		
Frederick, Paul	Kevin Warren		
Parsons, Wayne	Kevin Warren		
Richman, Marcus	Kevin Warren		
Meyerhoff, Curt	Michelle Passfeld		
Zidzik, Jim	Norm Fenlason		
Zrebiec, Don	Norm Fenlason		
Gill, Janet	Michelle Passfeld		
Zwissler, Bob	Michelle Passfeld		
Pearce, Doug	Norm Fenlason		
LT Abbott, Brian	Norm Fenlason		
Allen, Ollie	Rich O'Brien		
TBD	Kevin Warren		
Carroll, Walter	Kevin Warren		
Roberts, Dave	Mike Heinz		
Hanley, Bob	Kevin Warren		
Slade, Chuck	Kevin Warren		
LtCol Macone	Kevin Warren		
MAJ White, Brad	Kevin Warren		
MAJ Burgess	Kevin Warren		



## 8 SCHEDULE

The schedule below is driven by the COA expected approval date of 30 June 2011. The VMU 2 will be returning from deployment in June and are expecting to train for the summer prior to another deployment in the fall. The dates below have no lag time and therefore are no longer flexible.

Schedule	
SME Working Group	Recurring
Meeting with FAA	Recurring
Final Artifacts for SME to Review	7-Feb-11
Complete Artifacts Adjudication with SMEs	25-Feb-11
Collect SMEs Final Signatures on Artifacts	04-Mar-11
NAVAIR Approval/Document Delivery	11-Mar-11
Artifacts Submission to VMU 2	15-Mar-11
VMU2 COA Submission	30-Mar-11
VMU 2 COA Approval	30-Jun-11

**APPENDIX A****Cherry Point GBSAA Artifact List**

The list of artifacts that require review by the SMEs is below. Should further artifacts be identified this plan will be updated.

No.	Artifacts	Software	Radar	UAS	GBSAA	Ops
1	4583-0002, System Requirements Document for the OJ-753(V)1 (STARCON Replacement) Display Console, NAWCAD, St. Inigoes, 03 December 2003.	X				
2	4583-D2010006 Software Requirements Specification Document, v1.2, NAWCAD, St. Inigoes, July 28, 2010.	X				
3	4583-D2010011 Software Requirements Traceability Matrix, v1.1.	X				
4	4583-D2010007, System Test Plan, GBSAA Operator Display Console Prototype, v1.0, NAWCAD, St. Inigoes, June 10, 2010;	X				
5	4583-0323, Factory Acceptance Test (FAT) Report for the OJ-753(V)1 (STARCON Replacement) Display Console, NAWCAD, St. Inigoes, 17 December 2002.	X				
6	4583-D20102022, <i>Factory Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon)</i> , Version 1.0, NAWCAD, St. Inigoes, 8 July 2010.	X				
7	4583-D2010008, Factory Acceptance Test (FAT) System Test Description for the Ground Based Sense and Avoid (GBSAA) Operator Display Console (GOCon) Prototype, Version 1.0, NAWCAD, St. Inigoes, 21 June 2010.	X				
8	4583-D2010018, Operational Site Acceptance Test System Test Description, v1.0, NAWCAD, St. Inigoes, July 08, 2010.	X				
9	4583-D20102025, <i>Operational Site Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon)</i> , Version 1.0, NAWCAD, St. Inigoes, 15 July 2010.	X				
10	4583-D2010019 TECHNICAL MANUAL CONSOLIDATED OPERATORS MANUAL GROUND BASED SENSE AND AVOID (GBSAA) DISPLAY CONSOLE (GOCon) PROTOTYPE Version 1.0 11 August 2010					
11	GBSAA DASR Data Analysis MCAS Cherry Point, SPAWAR Systems Center ATLANTIC, Jan 2011		X			
12	MCAS Cherry Point, NC, DASR Flight Check Report, SPAWAR Systems Center ATLANTIC, February 4, 2010.		X			
13	NAWCADPAX/EDR-2010/171, <i>Engineering Data Report, MCAS Cherry Point Ground Based Sense And Avoid (GBSAA), Demonstration System Flight Test Data Package</i> , NAWCAD, Patuxent River, 5 October 2010.		X			
14	Final Flight Test Report		X			

No.	Artifacts	Software	Radar	UAS	GBSAA	Ops
15	Retest Flight Test Report		X			
16	Ground Based Sense And Avoid (GBSAA) Demonstration System at Marine Corps Air Station (MCAS) Cherry Point, NC Performance and Verification Testing, 02 April 2010.		X			
17	GSC05, Marine Corps Air Station (MCAS) Cherry Point Shadow Ground Based Sense and Avoid (GBSAA) Requirements, Version 2.0, September 1, 2010.				X	
18	GSC18, Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Architecture, Version 1.2, July 2010.				X	
19	GSC18_SV-10c, Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Systems View (SV)-10c Architecture, Version 1.0, 24 September 2010.				X	
20	GSC14, GBSAA Operations and Procedures Manual Cherry Point, Version 1.0, September 24, 2010				X	X
21	Cherry Point Timeline Analysis & Popup Vignettes, Johns Hopkins University Applied Physics Laboratory, October 8, 2010.				X	X
22	Concept of Employment at Marine Corps Air Station Cherry Point NC, GSC03, Version 1.2, July 2010.				X	X
23	Training Materials (GBSAA Training, Software Training)				X	X
24	MCAS Cherry Point Airspace Characterization and Radar Performance Analysis, SPAWAR Atlantic, JIPT Track 1 Team, February 2009.					X
25	Cherry Point Airspace Characterization, Encounter Probability Analysis 20 August 2010					X
26	Probabilistic Risk Assessment (PRA) of Ground-Based Sense and Avoid (GBSAA) UAS Operations at Marine Corps Air Station, Cherry Point, NC, October 18, 2010					X
27	CP GBSAA Operational Safety Assessment (OSA) (to be updated)					X

No.	References	Software	Radar	UAS	GBSAA	Ops	Background
1	FAA ASR-11 Hardware Maintenance Training Handbook (June 2005)		X				X
2	TM 9-5895-681-CL, A1-RQ7BA-NFM-500, Technical Manual, Operator's And Crewmember's Checklist For Army Unmanned Aircraft System Tactical Unmanned Aircraft System (TUAS), SHADOW 200, (EIC: 60A), 11 July 2007			X			X
3	RQ-7B Shadow UAS Operational Assessment: Marine Corps Air Station, Cherry Point, NC, Karen Buondonno, et al, Draft Version 2.1, (not distributed), April 9, 2010. (aka Tech Center Demonstration)				X		X
4	TM 9-5895-681-CL, A1-RQ7BA-NFM-500, Technical Manual, Operator's And Crewmember's Checklist For Army Unmanned Aircraft System Tactical Unmanned Aircraft System (TUAS), SHADOW 200, (EIC: 60A), 11 July 2007			X			X
5	FAA ASR-11 Hardware Maintenance Training Handbook (June 2005)		X				X
6	ATCFacO P3722.1N, <i>Air Traffic Control Facility Manual</i> , MCAS Cherry Point Air Traffic Control (NKT), January 1, 2009.					X	X
7	September 23, 2010, SME Review Meeting.					X	X
8	NAVAIR INST 5100.11A <i>Research and Engineering Technical Review of Risk Process and Procedure for Processing Grounding Bulletins</i> , November 28, 2005, Encl (2).					X	X
9	<i>Software Assurance Assessment Letter</i>	X					
10	SSG708688, <i>Digital Airport Surveillance Radar (DASR), Contract Attachment 6 - System Specification and SRD Cross Reference</i> , Rev-DC, Raytheon Electronic Systems, 17 July 1999.		X				
11	Naval Air Station Patuxent River, AN/GPN-30 (ASR-11) Primary / Secondary Terminal Radar Siting Report, SPAWAR Systems Center CHARLESTON.		X				
12	PMA-263 Shadow Class Desk holding (Air Worthiness Release)			X			

No.	References	Software	Radar	UAS	GBSAA	Ops	Background
13	Software Assurance Assessment Letter	X					
14	On Estimating Mid-Air Collision Risk, AIAA 2010-9333, Kochenderfer, et al, 13 - 15 September 2010.						X
15	MCAS Cherry Point Airspace Characterization and Radar Performance Analysis, SPAWAR Atlantic, JIPT Track 1 Team, February 2009.						X

## APPENDIX B

### Intro to the CP GBSAA Safety Argument

#### Purpose

The purpose of the Safety Argument is to provide a hierarchical structure to prove the assertion that the system operated in its intended environment is acceptably safe. This assertion is structured in a case-based format and includes the presentation of valid evidence supporting the various sub-claims. The argument is decomposed to provide assertions at different levels that inarguably prove that the safety claim is true. The evidence must be believable and developed within a safety context. Identification of the evidence using the safety argument structure provides pointers into the development life-cycle to ensure the evidence is rigorously and defensibly generated. An Initial Safety Argument is developed in the early stages of the life-cycle to assist planners of activities intending to generate this evidence. Where missing evidence prevails, the program develops additional tasks or validation activities.

The Cherry Point GBSAA Initial Safety Argument was used in the safety assessment of the GBSAA system and to ensure that necessary assessment of its operational procedures proves the safety claim. Existing safety assessment methodology is incorporated into the safety argument using pointers into the development tasks and their resulting artifacts. For example, a Functional Hazard Assessment is an activity that is identified in the Argument. The Functional Hazard Assessment (FHA) is well defined in nearly all safety assessment paradigms.

To ensure that sufficient safety engineering in a safety paradigm has been performed, the safety considerations are asserted up front using the Argument. The development of safety objectives then follows the normal development course to safety critical requirement identification. The Safety Argument does not replace this process; it notes that it has been done to a level acceptable for safety assessment.

The Initial Safety Argument was developed using Goal Structuring Notation (GSN). GSN provides a unified graphical symbology and standardized composition elements to create re-usable safety arguments. GSN is a technique that has been used in the United Kingdom by their Ministry of Defense (MoD). The technique's guidance is simple, but its application is profound. A key to the symbology is shown in **Error! Reference source not found..** Not all the elements



n the figure are required in all arguments (also called claims or goals). The symbology is powerful in quickly seeing how an argument is formulated and defended.

Using GSN supports the hierarchical decomposition of the safety claim by mapping the evidence required to defend each sub-claim. The Cherry Point GBSAA program used it in just this capacity.

### Top Level Argument (arg-0)

The top-level safety argument for the Cherry Point GBSAA system and its operations is shown in **Error! Reference source not found.**, below. Evolution of the claim for arg-0 was focused on reducing safety risk of GBSAA-based transit operations at MCAS Cherry Point to acceptable levels. In NAVAIR terms, i.e. using NAVAIR 5100.11A risk assessment as direction, this means Acceptable without Review, which is low risk.

Top Level Argument				
Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
Arg-1 The GBSAA as designed, implemented, and functioning as intended is acceptably safe.	Arg-1.1 The GBSAA is specified to be acceptably safe.	Arg- 1.1.1 Safety objectives have been developed.	1.1.1.1. Safety objectives documented in CP GBSAA Safety Plan	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated)</li> </ul>
			1.1.1.2. Safety objectives review by Navy Safety Office	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated);</li> <li>September 23, 2010, SME Review Meeting.</li> </ul>
		Arg-1.1.2 Safety critical requirements have been identified and defined.	1.1.2.1. CP GBSAA reqs tagged as safety reqs. (See database)	<ul style="list-style-type: none"> <li>GSC05, <i>Marine Corps Air Station (MCAS) Cherry Point Shadow Ground Based Sense and Avoid (GBSAA) Requirements</i>, Version 2.0, September 1, 2010.</li> </ul>
		Arg-1.1.3 Safety critical requirements have been validated.	1.1.3.1. FAA Demo report	<ul style="list-style-type: none"> <li><i>RQ-7B Shadow UAS Operational Assessment: Marine Corps Air Station, Cherry Point, NC</i>, Karen Buondonno, et al, Draft Version 2.1, (not distributed), April 9, 2010. (aka Tech Center Demonstration)</li> </ul>
			1.1.3.2 CONEMP analysis (sections)	<ul style="list-style-type: none"> <li><i>Cherry Point Timeline Analysis &amp; Popup Vignettes</i>, Johns Hopkins University Applied Physics Laboratory, October 8, 2010;</li> <li><i>Concept of Employment at Marine Corps Air Station Cherry Point NC</i>, GSC03, Version 1.2,</li> </ul>

Top Level Argument				
Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
				July 2010.
			1.1.3.3. Other analysis	<ul style="list-style-type: none"> <li>GBSAA Airspace Characterization DASR (AN/GPN-30) MCAS Cherry Point, NC, SPAWAR Systems Center ATLANTIC, September 23, 2010;</li> <li>MCAS Cherry Point Airspace Characterization and Radar Performance Analysis, SPAWAR Atlantic, JIPT Track 1 Team, February 2009;</li> <li>GBSAA Data Analysis Airspace Characterization, SPAWAR Systems Center ATLANTIC, November 15, 2010.</li> <li>25, 27, 29</li> </ul>
		Arg-1.1.4 Safety critical requirements have been allocated to GBSAA components.	1.1.4.1. Safety reqs traced to component reqs	<ul style="list-style-type: none"> <li>4583-D2010006 Software Requirements Specification Document, v1.2, NAWCAD, St. Inigoes, July 28, 2010;</li> <li>4583-D2010011 Software Requirements Traceability Matrix, v1.1;</li> <li>SSG708688, Digital Airport Surveillance Radar (DASR), Contract Attachment 6 - System Specification and SRD Cross Reference, Rev-DC, Raytheon Electronic Systems, 17 July 1999;</li> <li>GSC05, Marine Corps Air Station (MCAS) Cherry Point Shadow Ground Based Sense and Avoid (GBSAA) Requirements, Version 2.0, September 1, 2010.</li> </ul>
		Arg-1.1.5 Design is robust and functions correctly under all expected conditions.	1.1.5.1. GBSAA Demo	<ul style="list-style-type: none"> <li>TBD</li> </ul>
			1.1.5.2. Airspace Characterization analyses	<ul style="list-style-type: none"> <li>MCAS Cherry Point Airspace Characterization and Radar Performance Analysis, SPAWAR Atlantic, JIPT Track 1 Team, February 2009;</li> <li>Cherry Point Airspace Characterization, Encounter Probability Analysis 20 August 2010.</li> </ul>
			1.1.5.3. Radar Analyses	<ul style="list-style-type: none"> <li>GBSAA DASR Data Analysis MCAS Cherry Point, SPAWAR Systems Center ATLANTIC, July 16, 2010;</li> <li>GBSAA Airspace Characterization DASR (AN/GPN-30) MCAS Cherry Point, NC, SPAWAR Systems Center ATLANTIC, September 23, 2010;</li> <li>MCAS Cherry Point Airspace Characterization and Radar Performance Analysis, SPAWAR Atlantic, JIPT Track 1 Team, February 2009;</li> <li>GBSAA Data Analysis Airspace</li> </ul>

Top Level Argument				
Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
				Characterization, SPAWAR Systems Center ATLANTIC, November 15, 2010.
			1.1.5.4. CP GBSAA Architecture	<ul style="list-style-type: none"> <li>GSC18, <i>Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Architecture</i>, Version 1.2, July 2010;</li> <li>GSC18_SV-10c, <i>Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Systems View (SV)-10c Architecture</i>, Version 1.0, 24 September 2010.</li> </ul>
		Arg-1.1.6 Safety critical GBSAA component requirements have been defined.	1.1.6.1. Component SW specs trace to System Spec	<ul style="list-style-type: none"> <li>4583-D2010011 Software Requirements Traceability Matrix, v1.1.</li> </ul>
			1.1.6.2. Component HW specs trace to System Spec	<ul style="list-style-type: none"> <li>4583-0002, <i>System Requirements Document for the OJ-753(V)1 (STARCON Replacement) Display Console</i>, NAWCAD, St. Inigoes, 03 December 2003.</li> </ul>
		Arg-1.1.7 Procedural safety mitigations have been identified and documented.	1.1.7.1. Trace to Ops & Procedures Document	<ul style="list-style-type: none"> <li>GSC14, <i>GBSAA Operations and Procedures Manual Cherry Point</i>, Version 1.0, September 24, 2010.</li> </ul>
			1.1.7.2. Operational Hazard Assessment w/mitigations identified	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated).</li> </ul>
			1.1.7.3. Functional Hazard Assessment w/mitigations identified	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated).</li> </ul>
			1.1.7.4. CP GBSAA Architecture	<ul style="list-style-type: none"> <li>GSC18, <i>Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Architecture</i>, Version 1.2, July 2010;</li> <li>GSC18_SV-10c, <i>Marine Corps Air Station Cherry Point Shadow RQ-7B UAS Future Operations Systems View (SV)-10c Architecture</i>, Version 1.0, 24 September 2010.</li> </ul>
	Arg-1.2	Arg-1.2.1 The	1.2.1.1. DASR	<ul style="list-style-type: none"> <li>Naval Air Station Patuxent River, AN/GPN-30</li> </ul>



Top Level Argument				
Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
	The GBSAA is implemented in accordance with specifications.	DASR-11 Radar meets all allocated GBSAA System Requirements.	FAA Certification Report	(ASR-11) Primary / Secondary Terminal Radar Siting Report, SPAWAR Systems Center CHARLESTON.
			1.2.1.2. Installed Radar Test Report	<ul style="list-style-type: none"> <li>MCAS Cherry Point, NC, DASR Flight Check Report, SPAWAR Systems Center ALANTIC, February 4, 2010.</li> </ul>
			1.2.2.1 Software V&V	<ul style="list-style-type: none"> <li>4583-0002, System Requirements Document for the OJ-753(V)1 (STARCON Replacement) Display Console, NAWCAD, St. Inigoes, 03 December 2003;</li> <li>4583-D2010006 Software Requirements Specification Document, v1.2, NAWCAD, St. Inigoes, July 28, 2010;</li> <li>4583-D2010011 Software Requirements Traceability Matrix, v1.1;</li> <li>4583-D2010007, System Test Plan, GBSAA Operator Display Console Prototype, v1.0, NAWCAD, St. Inigoes, June 10, 2010;</li> <li>4583-0323, Factory Acceptance Test (FAT) Report for the OJ-753(V)1 (STARCON Replacement) Display Console, NAWCAD, St. Inigoes, 17 December 2002;</li> <li>4583-D2010008, Factory Acceptance Test (FAT) System Test Description for the Ground Based Sense and Avoid (GBSAA) Operator Display Console (GOCon) Prototype, Version 1.0, NAWCAD, St. Inigoes, 21 June 2010;</li> <li>4583-D20102022, Factory Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon), Version 1.0, NAWCAD, St. Inigoes, 8 July 2010;</li> <li>4583-D2010018, Operational Site Acceptance Test System Test Description, v1.0, NAWCAD, St. Inigoes, July 08, 2010;</li> <li>4583-D20102025, Operational Site Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon), Version 1.0, NAWCAD, St. Inigoes, 15 July 2010.</li> <li>Software Assurance Certification Letter(?)</li> </ul>
		Arg-1.2.2 The GBSAA Tracking and Alerting components	Tracking & Alerting Test Report	<ul style="list-style-type: none"> <li>4583-D20102022, Factory Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon), Version 1.0, NAWCAD, St. Inigoes, 8 July 2010;</li> </ul>

Top Level Argument				
<b>Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.</b>				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
		meet all allocated GBSAA System Requirements.		<ul style="list-style-type: none"> <li>4583-D20102025, <i>Operational Site Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon)</i>, Version 1.0, NAWCAD, St. Inigoes, 15 July 2010</li> </ul>
			1.2.2.3. Tracking & Alerting Test Plans	<ul style="list-style-type: none"> <li>4583-D2010007, <i>System Test Plan, GBSAA Operator Display Console Prototype</i>, v1.0, NAWCAD, St. Inigoes, June 10, 2010;</li> <li>4583-D2010008, <i>Factory Acceptance Test (FAT) System Test Description for the Ground Based Sense and Avoid (GBSAA) Operator Display Console (GOCon) Prototype</i>, Version 1.0, NAWCAD, St. Inigoes, 21 June 2010;</li> <li>4583-D2010018, <i>Operational Site Acceptance Test System Test Description</i>, v1.0, NAWCAD, St. Inigoes, July 08, 2010;</li> </ul>
		Arg-1.2.3 The GBSAA controller console (STARCON) meets all allocated GBSAA System Requirements.	1.2.3.1. STARCON Certification Report	<ul style="list-style-type: none"> <li>4583-0323, <i>Factory Acceptance Test (FAT) Report for the OJ-753(V)1 (STARCON Replacement) Display Console</i>, NAWCAD, St. Inigoes, 17 December 2002.</li> </ul>
			1.2.3.2. STARCON Test Reports	<ul style="list-style-type: none"> <li>4583-0323, <i>Factory Acceptance Test (FAT) Report for the OJ-753(V)1 (STARCON Replacement) Display Console</i>, NAWCAD, St. Inigoes, 17 December 2002.</li> </ul>
		Arg-1.2.4 Integrated GBSAA System performance meets all allocated System Requirements.	1.2.4.1. GBSAA System Safety Assessment (SSA)	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated).</li> </ul>
			1.2.4.2. GBSAA System Test Plan	<ul style="list-style-type: none"> <li><i>Ground Based Sense And Avoid (GBSAA) Demonstration System at Marine Corps Air Station (MCAS) Cherry Point, NC Performance and Verification Testing</i>, 02 April 2010.</li> </ul>
			1.2.4.3. GBSAA System Test	<ul style="list-style-type: none"> <li>NAWCADPAX/EDR-2010/171, <i>Engineering Data Report, MCAS Cherry Point Ground</i></li> </ul>

Top Level Argument				
Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
			Report	<i>Based Sense And Avoid (GBSAA), Demonstration System Flight Test Data Package, NAWCAD, Patuxent River, 5 October 2010;</i> <ul style="list-style-type: none"> <li>Final Flight Test</li> <li>Flight Retest Quicklook</li> <li>Flight Retest Final.</li> </ul>
		Arg-1.2.5 GBSAA System performs robustly and functions correctly under all expected conditions.	1.2.5.1. GBSAA System Test Report	<ul style="list-style-type: none"> <li>NAWCADPAX/EDR-2010/171, <i>Engineering Data Report, MCAS Cherry Point Ground Based Sense And Avoid (GBSAA), Demonstration System Flight Test Data Package, NAWCAD, Patuxent River, 5 October 2010;</i></li> <li>Final Flight Test</li> <li>Flight Retest Quicklook</li> <li>Flight Retest Final.</li> </ul>
			1.2.5.2. GBSAA Demo event	<ul style="list-style-type: none"> <li>TBD</li> </ul>
			1.2.5.3. GBSAA Operational Safety Assessment	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated)</li> </ul>
			1.2.5.4. Exception Test reporting (hazard exceptions)	<ul style="list-style-type: none"> <li>4583-D20102022, <i>Factory Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon), Version 1.0, NAWCAD, St. Inigoes, 8 July 2010;</i></li> <li>4583-D20102025, <i>Operational Site Acceptance Test Report for the Ground Based Sense and Avoid (GBSAA) Display Console (GOCon), Version 1.0, NAWCAD, St. Inigoes, 15 July 2010.</i></li> </ul>
		Arg-1.2.6 All identified hazards have been	1.2.6.1. GBSAA Operational Safety Assessment	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated)</li> </ul>

Top Level Argument				
<b>Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.</b>				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
		mitigated in the GBSAA implementation.	1.2.6.2. Ops & Procedures Documents	<ul style="list-style-type: none"> <li>GSC14, <i>GBSAA Operations and Procedures Manual Cherry Point</i>, Version 1.0, September 24, 2010.</li> </ul>
Arg-2 UAS operations at MCAS Cherry Point using the GBSAA system are acceptably safe.	Arg-2.1 GBSAA System operational safety hazards have been identified.		2.1.1. Operational Hazard Assessment w/mitigations identified (OSA)	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated)</li> </ul>
	Arg-2.2 GBSAA Operational limits have been identified.		2.2.1. Operational Hazard Assessment w/mitigations identified (OSA)	<ul style="list-style-type: none"> <li>CP GBSAA Operational Safety Assessment (OSA) (to be updated)</li> </ul>
			2.2.2. GBSAA Ops & Procedures Documents	<ul style="list-style-type: none"> <li>GSC14, <i>GBSAA Operations and Procedures Manual Cherry Point</i>, Version 1.0, September 24, 2010.</li> </ul>
	Arg-2.3 GBSAA System operational procedures mitigate known safety hazards and limits.		2.3.1. GBSAA Ops & Procedures Documents	<ul style="list-style-type: none"> <li>GSC14, <i>GBSAA Operations and Procedures Manual Cherry Point</i>, Version 1.0, September 24, 2010.</li> </ul>
			2.3.2. MCAS CP UAS Operator Flight Instructions	<ul style="list-style-type: none"> <li>N/A</li> </ul>
			2.3.3. Probabilistic Risk Assessment / Event Tree Analysis	<ul style="list-style-type: none"> <li><i>Probabilistic Risk Assessment (PRA) of Ground-Based Sense and Avoid (GBSAA) UAS Operations at Marine Corps Air Station, Cherry Point, NC</i>, October 18, 2010.</li> </ul>
			2.3.4. GBSAA Maint. Plans & Procedures	<ul style="list-style-type: none"> <li>N/A</li> </ul>

Top Level Argument				
<b>Arg-0 The use of the GBSAA system supports acceptably safe UAS transit operations between Marine Corps Air Station Cherry Point to nearby Restricted Airspace.</b>				
Top Level Sub-Argument	Primary Sub-Argument	Leaf Argument	Evidence Type	Documents Actual Artifact
	Arg-2.4 GBSAA System operators and maintainers are trained in safety procedures.		2.4.1. GBSAA Maint. Plans & Procedures	<ul style="list-style-type: none"> <li>N/A</li> </ul>
			2.4.2. Maintainer Training Plans	<ul style="list-style-type: none"> <li>N/A</li> </ul>
			2.4.3. Operator Training Plans	<ul style="list-style-type: none"> <li>TBD</li> </ul>
	Arg-2.5 The UAS meets all operational constraints for the intended airspace, including airworthiness.		2.5.1. Tri-Service UAS AW Certification	<ul style="list-style-type: none"> <li>PMA-263 Shadow Class Desk holding (Air Worthiness Release);</li> <li>TM 9-5895-681-CL, A1-RQ7BA-NFM-500, Technical Manual, Operator's And Crewmember's Checklist For Army Unmanned Aircraft System Tactical Unmanned Aircraft System (TUAS), SHADOW 200, (EIC: 60A), 11 July 2007.</li> </ul>
			2.5.2. VMU-2 ORM	<ul style="list-style-type: none"> <li>N/A</li> </ul>
	Arg-2.6 Interfaces to external NAS elements are implemented.		2.6.1. GBSAA System Demo	<ul style="list-style-type: none"> <li>TBD</li> </ul>



Enclosure (5)

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**CERTIFICATE OF WAIVER OR AUTHORIZATION**

## ISSUED TO

United States Marine Corps

Marine Unmanned Aerial Vehicle Squadron Two (VMU-2)

PSC box 8977

MCAS Cherry Point, NC 28533

Attn: Commanding Officer, VMU-2

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

## OPERATIONS AUTHORIZED

Operation of the Shadow RQ-7B Unmanned Aircraft System (UAS) in Class D & E airspace at over the Cherry Point MCAS to R-5306C/D under the jurisdiction of the Cherry Point Approach Control

## LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

**STANDARD PROVISIONS**

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

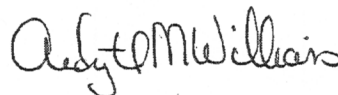
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

**SPECIAL PROVISIONS**

Special Provisions are set forth and attached.

This certificate 2011-ESA-71 is effective from December 9, 2011 to December 8, 2012, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR



FAA Headquarters, AJV-13

(Region)

For: M. Randy Willis

(Signature)

December 9, 2011

(Date)

Acting Manager, Unmanned Aircraft Systems

(Title)

**ATTACHMENT to FAA FORM 7711-1**

**Issued To:** United States Marine Corps

**Address:** Marine Unmanned Aerial Vehicle Squadron Two (VMU-2)  
PSC box 8977  
MCAS Cherry Point, NC 28533  
Attn: Commanding Officer, VMU-2

**Activity:** Operation of the Shadow RQ-7B Unmanned Aircraft System (UAS) in Class D & E airspace at over the Cherry Point MCAS to R-5306C/D under the jurisdiction of the Cherry Point Approach Control.

**Purpose:** To prescribe UAS operating requirements (outside of restricted and/or warning area airspace) in the National Airspace System (NAS) for the purpose of training and/or operational flights.

**Dates of Use:** This Certificate of Authorization (COA) 2011-ESA-71 is valid from December 9, 2011 through December 8, 2012. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 days prior to the requested effective date.

**General Provisions:**

- The review of this activity is based on our current understanding of UAS operations, and the impact of such operations in the NAS, and therefore should not be considered a precedent for future operations. As changes occur in the UAS industry, or in our understanding of it, there may be changes to the limitations and conditions for similar operations.
- All personnel connected with the UAS operation must comply with the contents of this authorization and its provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

**Safety Provisions:**

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted areas, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. In accordance with 14 CFR Part 91, General Operating and Flight Rules, Subpart J-Waivers, 91.903, Policy and Procedures, the following provisions provide acceptable mitigation of 14 CFR Part 91.111/113 and must be complied with:



- For the purpose of see-and-avoid, visual observers must be utilized at all times except in Class A airspace, restricted areas, and warning areas. The observers may either be ground based or in a chase plane. If the chase aircraft is operating more than 100ft above/below and or ½ nm laterally, of the UA, the chase aircraft PIC will advise the controlling ATC facility.
- In order to comply with the see and avoid requirements of Title 14 of the Code of Federal Regulations sections 91.111 and 91.113, the pilot-in-command and visual observers must be able to see the aircraft and the surrounding airspace throughout the entire flight; and be able to determine the aircraft's altitude, flight path and proximity to traffic and other hazards (terrain, weather, structures) sufficiently to exercise effective control of the aircraft to give right-of-way to other aircraft, and to prevent the aircraft from creating a collision hazard.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Cloud clearances and VFR visibilities for Class E airspace will be used regardless of class of airspace. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.
- The dropping or spraying of aircraft stores, or carrying of hazardous materials (included ordnance) outside of active Restricted, Prohibited, or Warning Areas is prohibited unless specifically authorized in the Special Provisions of this COA.

#### **Airworthiness Certification Provisions:**

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft must contain one of the following:
  - A civil airworthiness certification from the FAA, or
  - A statement specifying that the Department of Defense Handbook "Airworthiness Certification Criteria" (MIL-HDBK-516), as amended, was used to certify the aircraft or
  - Equivalent method of certification.

#### **Pilot / Observer Provisions:**

- **Pilot Qualifications:** UA pilots interacting with Air Traffic Control (ATC) shall have sufficient expertise to perform that task readily. Pilots must have an understanding of and comply with Federal Aviation Regulations and Military Regulations applicable to the airspace where the UA will operate. Pilots must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA pilots.
- Aircraft and Operations Requirements:
  - Flight Below 18,000 Feet Mean Sea Level (MSL).
    - UA operations below 18,000 feet MSL in any airspace generally accessible to aircraft flying in accordance with visual flight rules (VFR) require visual

- observers, either airborne or ground-based. Use of ATC radar alone does not constitute sufficient collision risk mitigation in airspace where uncooperative airborne operations may be conducted.
- Flights At or Above 18,000 Feet Mean Sea Level (MSL)
    - When operating on an instrument ATC clearance, the UA pilot-in-command must ensure the following:
      1. An ATC clearance has been filed, obtained and followed.
      2. Positional information shall be provided in reference to established NAS fixes, NAVAIDS, and waypoints. Use of Latitude/Longitude is not authorized.
  - **Observer Qualifications:** Observers must have been provided with sufficient training to communicate clearly to the pilot any turning instructions required to stay clear of conflicting traffic. Observers will receive training on rules and responsibilities described in 14 CFR 91.111, *Operating Near Other Aircraft*, 14 CFR 91.113, *Right-of-Way Rules*, cloud clearance, in-flight visibility, and the pilot controller glossary including standard ATC phraseology and communication. Observers must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA observers.
  - **Pilot-in-Command (PIC) –**
    - **Visual Flight Rules (VFR) as applicable:**
      - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
      - The PIC operating a UA in line of sight must pass at a minimum the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105, and must keep their aeronautical knowledge up to date.
      - There is no intent to suggest that there is any requirement for the UAS PIC to be qualified as a crewmember of a manned aircraft.
      - Pilots flying a UA on other than instrument flight plans beyond line of sight of the PIC must possess a minimum of a current private pilot certificate, or military equivalent in the category and class, as stated in 14 CFR 61.105.
    - **Instrument Flight Rules (IFR) as applicable:**
      - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
      - The PIC must be a certified pilot (minimum of private pilot) of manned aircraft (FAA or military equivalent) in category and class of aircraft flown.
      - The PIC must also have a current/appropriate instrument rating (manned aircraft, FAA or military equivalent) for the category and class of aircraft flown.
  - **Pilot Proficiency – VFR/IFR as applicable:**

- Pilots will not act as a VFR/ IFR PIC unless they have had three qualified proficiency events within the preceding 90 days.
  - The term “qualified proficiency event” is a UAS-specific term necessary due to the diversity of UAS types and control systems.
  - A qualified proficiency event is an event requiring the pilot to exercise the training and skills unique to the UAS in which proficiency is maintained.
- Pilots will not act as an IFR PIC unless they have had six instrument qualifying events in the preceding six calendar months (an event that requires the PIC to exercise instrument flight skills unique to the UAS).
- **PIC Responsibilities:**
  - Pilots are responsible for a thorough preflight inspection of the UAS. Flight operations will not be undertaken unless the UAS is airworthy. The airworthiness provisions of 14 CFR 91.7, Civil Aircraft Airworthiness, or the military equivalent, apply.
  - One PIC must be designated at all times and is responsible for the safety of the UA and persons and property along the UA flight path.
  - The UAS pilot will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR 91.13, *Careless and Reckless Operation*, apply to UAS pilots.
- **Pilot/Observer Task Limitations:**
  - Pilots and observers must not perform crew duties for more than one UA at a time.
  - Chase aircraft pilots must not concurrently perform either observer or UA pilot duties along with chase pilot duties.
  - Pilots are not allowed to perform concurrent duties both as pilot and observer.
  - Observers are not allowed to perform concurrent duties both as pilot and observer.

**Standard Provisions:** These provisions are applicable to all operations unless indicated otherwise in the Special Provisions section.

- The UA PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions, unless specified otherwise in the Special Provisions section. The PIC shall comply with all ATC instructions and/or clearances.
- If equipped, the UA shall operate with an operational mode 3/A transponder, with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk.
- If equipped, the UA shall operate with position/navigation lights on at all times during flight.
- The UA PIC shall not accept any ATC clearance requiring the use of visual separation or sequencing.

- VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in, except when operating in Class A airspace where 14 CFR Part 91.155 will apply.
- Special VFR is not authorized.
- Operations (including lost link procedures) shall not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.
- Operations outside of restricted areas, warning areas, prohibited areas (designated for aviation use) and/or Class A airspace may only be conducted during daylight hours, unless authorized in the Special Provisions section.
- Operations shall not loiter on Victor airways, Jet Routes, Q Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR 91.159).
- The UA PIC or chase plane PIC (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.
- All operators that use GPS as a sole source must check all NOTAMs and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited without specific approval in the special provisions.
- At no time will TCAS be used in any mode while operating an unmanned aircraft.
- Only one UA will be flown in the operating area unless indicated otherwise in the Special Provisions.
- A copy of this COA will be maintained on site by the PIC or designated representative.
- The USMC, and/or its representatives, is responsible at all times for collision avoidance with non-participating aircraft and the safety of persons or property on the surface with respect to the UAS.

#### **Special Provisions:**

1. In the event of a lost link, the UAS pilot will immediately notify Cherry Point Control Tower via land line, state pilot intentions, and comply with the following provisions:
  - a. Operations within the Class D: Lost link procedures direct the UAS to fly to the NKT 360 degree radial at 4 DME at an altitude of 2000' and hold. The Mission Commander will immediately contact the tower controller via radio and inform them of lost link condition as well as the preprogrammed routing of the aircraft.
  - b. Operations within the R5306A/C: Lost link procedures direct the UAS to fly to the Piney Island military range complex (BT-11) at an altitude of 2000' and hold. BT 11 is located inside the R5306A/C (NKT 074/24) and is uninhabited except for a small contingent of range controllers and range maintenance personnel. BT-11 airspace extends from the surface to 17,999 ft AGL. The Mission Commander will immediately contact Cherry Targets via land line and inform them of lost link condition as well as the preprogrammed routing of the aircraft.

- c. Operations within the NAS transiting to/from Class D airspace to/from R5306A/C airspace. Once the UA has departed the either the Class D or R5306A/C if a lost link occurs the UA will continue on its current route until reaching its programmed destination. Once within either the Class D airspace or the R5306A/C Airspace the UA will follow the procedures listed in paragraph 5 a or b above which ever is applicable. The Mission Commander will immediately contact Cherry Point RADAR via radio and inform them of lost link condition as well as the preprogrammed routing of the aircraft.
- d. In the event that the link cannot be restored with the UAS during the predetermined holding period, the Flight Termination System (FTS) will be activated to allow for a controlled recovery. The FTS is an emergency system comprised of a recovery parachute that can be deployed from either the control station or by the aircraft once a pre-determined set of conditions have been met. Its function is to safely recover the air vehicle with minimum damage to the air vehicle, persons or property during an emergency flight termination.
2. Operations shall not be operated over populated areas, heavily trafficked roads, or an open-air assembly to include lost link procedures.
  3. Special VFR operations are not authorized.
  4. The United States Marine Corps has determined the airworthiness and safety of the Shadow RQ-7B UAS and submitted a letter stating such dated April 20, 2011. The aircraft must be operated in strict compliance with all provisions and conditions in this Airworthiness Release. (n addition, all normal and emergency procedures as outlined in the COA on-line application must be followed.
  5. Operations will remain within the confines of the operating areas defined in the COA on-line application
  6. Use of visual observers in a linear fashion away from the control station (daisy chaining) *is* authorized provided the Visual Observer Operating Procedures stated in the COA application are followed
  7. A pilot-in-command (PIC) must be designated prior to launch of the aircraft and must be at the controls or have access to the controls of the unmanned aircraft at any point during the flight.
  8. The PIC must conduct a pre-takeoff briefing on the contents of the CGA, maximum altitude to be flown, frequencies to be used, lost link procedures,

hazards unique for the flight to be flown, emergency procedures on takeoff and landing, and any special provisions.

9. The PIC and visual observer(s) must receive training under the direct supervision of a qualified instructor.
10. For night operations, the following limitations must be followed:
  - o UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (NOTE: This is equal to approximately 30 minutes after sunset until 30 minutes before sunrise.)
  - o UAS launch and recovery operations will take place wholly within MCAS Cherry Point Class D airspace while the air traffic control (ATC) tower is open and the Class D is active.
  - o External pilots and UAS ground observer(s) must be in place 30 minutes prior to night operations to ensure dark adaptation.
  - o The Shadow RQ-7B unmanned aircraft will operate navigation and strobe lights for all night operations while in the MCAS Cherry Point Class D airspace. Night operations are prohibited if the UAS lights are inoperative.
  - o Ground observers will undergo additional training on the lighting configuration of the Shadow RQ-7B to ensure proper recognition during night flight.
11. The mixing of civil manned and unmanned traffic within MCAS Cherry Point Class D airspace during launch and recovery operations is prohibited.
12. The proponent or delegated representative is responsible for halting or cancelling unmanned aircraft activity if, at any time, the safety of persons or property on the ground or in the air is jeopardized, or if there is a failure to comply with the provisions of the authorization
13. A frequency integrity check must be conducted prior to the launch of the Shadow RQ-7B unmanned aircraft:.
14. Sterile cockpit procedures must be observed during all critical phases of flight to including all ground operations involving taxi, takeoff, landing, and all other flight operations in which safety or mission accomplishment might be compromised by distractions.
15. The use of cell phones or other electronic devices is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with ATC.



16. ATC must be immediately notified in the event of any emergency, loss and subsequent restoration of command link or any other malfunction or occurrence that would impact air traffic safety or operations.
17. The PIC must have at least a current FAA private pilot's certificate or the FAA accepted agency equivalent, based on the application or Title 14 of the Code of Federal Regulations Part 61 for any operations above 400 feet AGL in Class G airspace, and all operations in Class D and E airspace.

**NOTAM:** A distance (D) Notice to Airmen shall be issued when UA operations are being conducted. This requirement may be accomplished through your local base operations or NOTAM issuing authority. You may also complete this requirement by contacting Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

- Name and Address of pilot filing NOTAM request
- Location, Altitude or the operating Area
- Time and nature of the activity

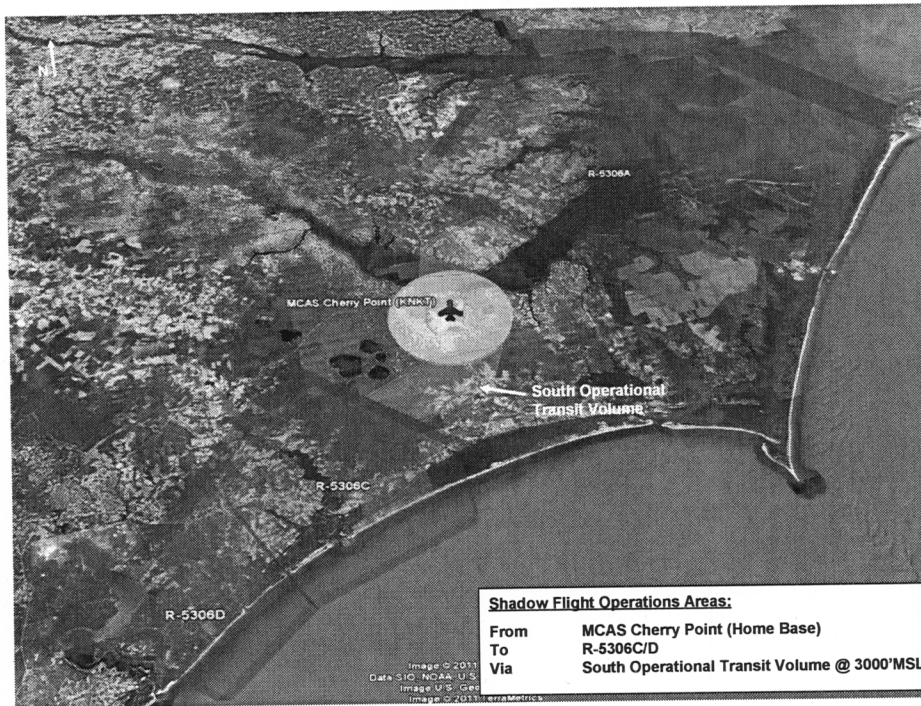
**NOTE FOR PROPONENTS FILING THEIR NOTAM WITH DoD ONLY:** This requirement to file with the AFSS is in addition to any local procedures/requirements for filing through DINS. The FAA Unmanned Aircraft Systems Office is working with the AFSS, and to eliminate the requirement to file a NOTAM with both the AFSS and DINS in the near future.

**Incident / Accident and Normal Reporting Provisions:** The following information is required to document routine and unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) on a monthly basis:
  - Number of flights conducted under this COA.
  - Pilot duty time per flight.
  - Unusual equipment malfunctions (hardware/software).
  - Deviations from ATC instructions.
  - Operational/coordination issues.
  - All periods of loss of link (telemetry, command and/or control)
- The following shall be submitted via COA Online, email or phone (202-385-4542, cell 443-569-1732) to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) **within 24 hours and prior to any additional flight under this COA:**
  - All accidents or incidents involving UAS activities, including lost link.
  - Deviations from any provision contained in the COA.

This COA does not, in itself, waive any Federal Aviation Regulation (FAR) nor any state law or local ordinance. Should the proposed operation conflict with any state law or

local ordinance, or require permission of local authorities or property owners, it is the responsibility of the USMC to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The USMC is hereby authorized to operate the Shadow Unmanned Aircraft System in the operations area depicted in "Activity" above and attachment 1 below.



Enclosure (6)



DEPARTMENT OF THE NAVY  
NAVAL AIR SYSTEMS COMMAND  
RADM WILLIAM A. MOFFETT BUILDING  
47123 BUSE ROAD, BLDG 2272  
PATUXENT RIVER, MARYLAND 20670-1547

IN REPLY REFER TO

13610  
Ser AIR-4.1/11-041  
10 Jun 2011

From: Director, Systems Engineering Department, AIR-4.1, 22347 Cedar Point Road, Building 2185, Suite 1232, Patuxent River, MD 20670-1907  
To: PEO (U&W), Attn: PMA-262, 47123 Buse Road, Building 2272, Suite 246, Patuxent River, MD 20670-1547

Subj: SAFE FOR USE CERTIFICATION FOR GROUND BASED SENSE AND AVOID (GBSAA) SYSTEM, MARINE CORPS AIR STATION (MCAS) CHERRY POINT, NORTH CAROLINA IN SUPPORT OF VMU-2 RQ-7B OPERATIONS

Ref: (a) Mtg btwn AIR-4.0, 4.0P, 4.1 of 11 Feb 2011  
(b) Commander, PMA-262, Safe For Use Certification Request of GBSAA System at MCAS Cherry Point, NC in Support of VMU-2, RQ-7B Operations, E-mail MSG ID NAEAPAXREZ02-110606221552Z-16548  
(c) GBSAA Configuration Document, MCAS Cherry Point, Doc. No. GSC 25, Version 1.0, Dtd June 3, 2011  
(d) GBSAA Operations and Procedures Manual, MCAS Cherry Point, Doc. No. GSC14, Version 1.5, Dtd June 3, 2011  
(e) NAVAIR System Safety Risk Assessment Matrix, AIR-4.0 letter 5100 Ser AIR-4.0/026, 14 Feb 2011  
(f) System Safety Assessment – Residual Risk Acceptance, CP GBSAA Mid-Air Collision (MAC) Hazard Risk, 01 Jun 2011  
(g) MCAS Cherry Point, VMU-2, Request for Certificate of Authorization (COA) ASN #2011-ESA-37-COA

1. Reference (a) delegated technical authority for the certification of airspace integration (sense and avoid) for unmanned systems under Naval Air Systems Command cognizance to the Director, AIR-4.1 on behalf of the Commander, Naval Air Systems Command.

2. In response to reference (b), Safe for Use Certification is granted for the Ground Based Sense and Avoid System in support of VMU-2 RQ-7B Shadow UAS day and night flight operations at MCAS Cherry Point, North Carolina.

3. Configuration: Baseline configuration in accordance with reference (c).

4. Limitations: MCAS Cherry Point GBSAA Operations are authorized in accordance with reference (d) and RQ-7B Flight Clearance associated with reference (g) approved COA. The MCAS Cherry Point GBSAA system is subject to the limitations in references (d) and (g) and the following (the most restrictive applies unless otherwise stated):

- a. GBSAA system is authorized for use only for VMU-2, RQ-7B UAS operations transiting through the Operational Transit Volumes (OTV), between the MCAS Cherry Point, North Carolina, Class D Surface Area (CDSA) and R-5306 A/C/D restricted areas as defined in reference (d).
- b. Class E Airspace Altitude limits: Minimum: 2600 ft AGL, Maximum: 3600 ft AGL.

Subj: SAFE FOR USE CERTIFICATION FOR GROUND BASED SENSE AND AVOID (GBSAA) SYSTEM, MARINE CORPS AIR STATION (MCAS) CHERRY POINT, NORTH CAROLINA IN SUPPORT OF VMU-2 RQ-7B OPERATIONS

- c. OTV Minimum Transit Speed limit: After climb to OTV transit altitude, the UA shall maintain a minimum 90 kt ground speed to and from MCAS Cherry Point, CDSA.
- d. Entry into the OTV is prohibited under GBSAA if a red or yellow alert exists, or if the system connectivity indicator is not rotating.
- e. Only one OTV may be active at a time for GBSAA operations.
- f. Only one UA at a time may transit through the active OTV when conducting GBSAA operations.

5. Warnings, Cautions and Notes: In accordance with reference (d).

-----NOTE-----

- a. VMU-2 UAC, MCAS Cherry Point ATC and the GBSAA operator should closely coordinate OTV transit operations prior to each mission.

6. Time Period: This Safe for Use Certification expires not later than 18-months from the effective date of this certification.

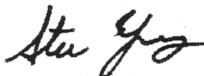
7. Points of Contact:

- a. Paul Frederick, AIR 4.1.1.5, PMA-262 Airspace Integration APMSE, Tel: (301) 757-5850, E-mail: paul.frederick@navy.mil
- b. Kevin Warren, Contract Support for AIR 4.1.1.5, PMA-262 Airspace Integration, Tel (301) 757-9217, E-mail: kevin.e.warren.ctr@navy.mil
- c. Susie Larson, Contract Support for AIR 4.1.1.5, PMA-262 Airspace Integration, Tel (301) 757-2441, E-mail: mariasusita.larson1.ctr@navy.mil

8. Other Remarks:

- a. GBSAA system use is contingent upon operational and system safety data collection and analysis as required in reference (f). Prior to reauthorization of the GBSAA system at the end of the expiration period, the safety risk assessment will be updated based on reference (f) data collection and analysis, and any required risk mitigations implemented.
- b. A medium risk hazard (categorized IAW reference (e)) has been identified with the system that is relevant to this Safe for Use Certification. Reference (f) documents acceptance of this risk by PMA-262.
- c. The GBSAA system is not intended to provide "see and avoid" risk mitigation to Cherry Point CDSA or surrounding Restricted Areas.
- d. This certificate provides NAVAIR safe for use certification subsequent to an engineering and system safety hazard review consistent with the proposed use and operational restrictions to ensure safety of flight and to reduce the risk to people, property, and/or environment.
- e. This certification does not authorize system modification. Contact paragraph 7.a, 7.b, or 7.c for policy guidance on configuration management and modification authority.
- f. Contact paragraph 7.a, 7.b, or 7.c for information regarding this certification.

9. For any questions, please call me at (301) 757-2328 or any of the points of contact listed above.



D. S. YOUNG  
SES Director, Systems Engineering Department



Enclosure (7)



#6

Marine Corps Forces Special Operations Command,  
2d Marine Aircraft Wing,  
Marine Corps Base Camp Lejeune, Marine Corps Air Station New River,  
and Marine Corps Air Station Cherry Point

LETTER OF AGREEMENT (LOA)

Effective: JUL 07 2011

SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

1. PURPOSE. To set forth procedures for UAS operations in the Stone Bay UAS Area.

2. CANCELATION. None.

3. SCOPE. The procedures herein shall apply to Marine Corps Forces Special Operations Command (MARSOC), 2d Marine Aircraft Wing (2d MAW), Marine Corps Base (MCB) Camp Lejeune, Marine Corps Air Station (MCAS) New River, and MCAS Cherry Point when UAS operations are being conducted in the Stone Bay UAS Area as depicted in Attachment 1. These procedures complement Marine Corps Base Camp Lejeune BO 3570.1 and JO 7110.65, and are in accordance with the instructions specified by the reference.

4. RESPONSIBILITIES

a. MARSOC is responsible for ensuring that the Class G Notification is renewed annually through USSOCOM.

b. MARSOC via USSOCOM is responsible for publishing the appropriate Notice To Airmen (NOTAM) concerning operations of UAS flights in the Stone Bay UAS Area. Additionally, MARSOC is solely responsible for scheduling and coordination for the Stone Bay UAS area with Marine Corps Base Range Control. 2d MAW will ensure that all subordinate commands are formally notified about the activation of the Stone Bay UAS area via Automated Message Handling System (AMHS) and Read and Initial.

c. Marine Corps Base Camp Lejeune Range Control Division (RCD) is ~~responsible for resolving scheduling conflicts and for notifying real~~ time activation and deactivation with Cherry Point and New River Air Traffic Control. RCD shall be responsible for notifying all range users of the current status of the Stone Bay UAS area when required.

d. Though VFR aircraft are not prohibited from flight within Class G airspace, MCAS Cherry Point and MCAS New River will be responsible to advise aircraft under their control when the Stone Bay UAS Area is in use.

Subj: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

5. PROCEDURES:

a. MARSOC shall:

(1) Use Range Facility Management Support System (RFMSS) to schedule the Stone Bay UAS Area with Marine Corps Base RCD not more than 90 days in advance and not less than 48 hours in advance.

(2) Provide a qualified Range Officer In Charge (ROIC) and Range Safety Officer (RSO). The ROIC will sign for the training area at Range Control.

(3) Plan and conduct all UAS operations using MCAS New River official weather reports. UAS operations are not authorized when MCAS New River official weather report is less than 1000 foot ceiling and/or three miles visibility.

(4) Establish and maintain radio communication with range control at all times.

(5) Contact Range Control, call sign "Blackburn", before commencing operations and immediately after securing operations at the Stone Bay UAS area. Primary frequency is 34.70, secondary is 40.10. Squelch must be turned off. When primary and secondary frequencies are out of service, call Blackburn at 910-451-3064 primary or 910-451-4449 secondary. All communications will be recorded.

(6) Maintain a visual observer who is not part of the UAS flight crew any time an Air Vehicle (AV) is airborne.

(7) Immediately notify Range Control of any lost link or MARSOC AV mishap.

(8) Immediately notify Range Control when a UAS inadvertently departs from or spills out of the Stone Bay UAS area.

b. MCB Camp Lejeune RCD shall:

(1) Notify MCAS Cherry Point and MCAS New River when Stone Bay UAS area is activated and deactivated.

(2) Issue advisories when Stone Bay UAS Area is in use.

(3) Inform MCAS New River and MCAS Cherry Point whenever a UAS has exited the Stone Bay UAS area.

c. MCAS New River and MCAS Cherry Point shall issue a Stone Bay UAS Area advisory to aircraft under their control that may be affected.

Subj: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

6. GENERAL:

a. The conditions of the Class G Notification are contained in Attachment 2. The actual Class G Notification will be implemented upon signature of this document. Class G Notifications will be effective for a period of 12 months from the date activated. MARSOC will disseminate the active Class G Notification by separate correspondence.

b. Deviation from the responsibilities and procedures outlined in this agreement may be effected only after coordination that clearly defines the responsibilities in each case. The terms of the Class G Notification in effect and subsequent updates may not be changed by local agencies.

c. The MARSOC UAS Program Manager shall maintain responsibility for this LOA.

d. UAS operations may be temporarily suspended during higher priority operations such as emergencies, MED EVAC, search and rescue and flight checks.

e. This LOA shall be reviewed annually by all signatories and shall be updated at least every five years from the effective date; sooner as may be required to conform to appropriate guidelines, subsequent FAA rulings and/or in response to lessons learned. Any permanent changes or modifications shall be executed in writing with the consent of all parties. This agreement shall remain in effect until cancelled by a subsequent LOA.

7. ATTACHMENTS:

a. Attachment 1. Stone Bay UAS Area

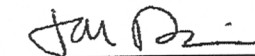
b. Attachment 2. Sample DoD Class G Notification ASN#XXXX-ESA-1-DOD Camp Lejeune, MMM YY

Subj: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

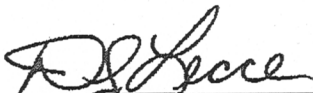
8. SIGNATURES:




P. E. LEFEBVRE  
Commander  
MARSOC



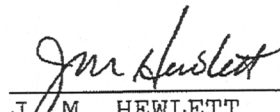
J. M. DAVIS  
Commanding General  
2d Marine Aircraft Wing



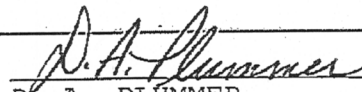
D. J. LECCE  
Commanding Officer  
Marine Corps Base Camp Lejeune



P. J. ZIMMERMAN  
Commanding Officer  
MCAS Cherry Point



J. M. HEWLETT  
Commanding Officer  
MCAS New River



D. A. PLUMMER  
Regional Airspace Coordinator  
Marine Corps Installations East

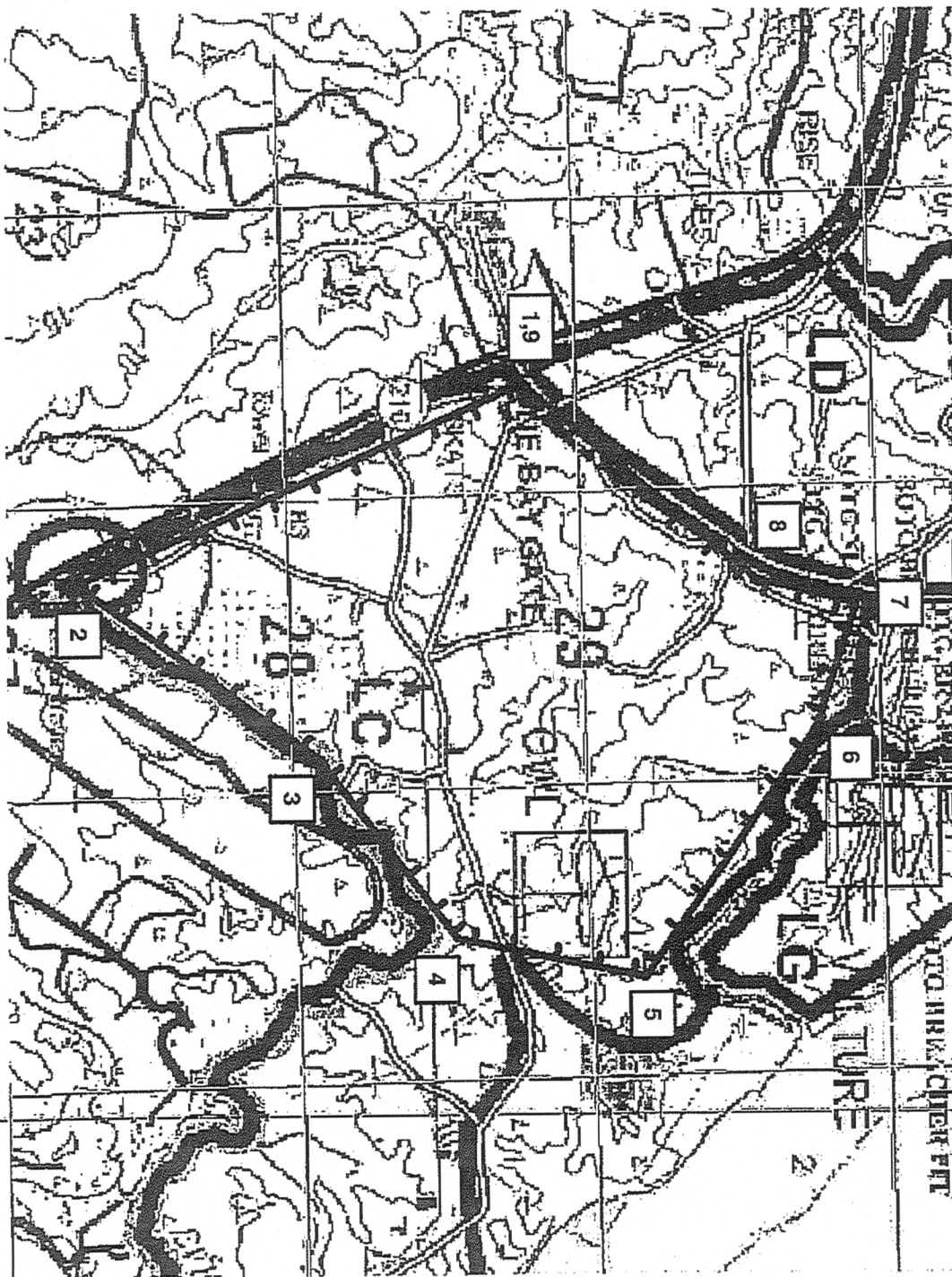


# Stone Bay UAS Area Dimensions

UNCLASSIFIED//FOUO



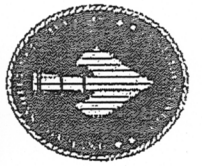
SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE MARINE CORPS BASE STONE BAY UAS AREA EFFECTIVE



Attachment (1)

UNCLASSIFIED//FOUO



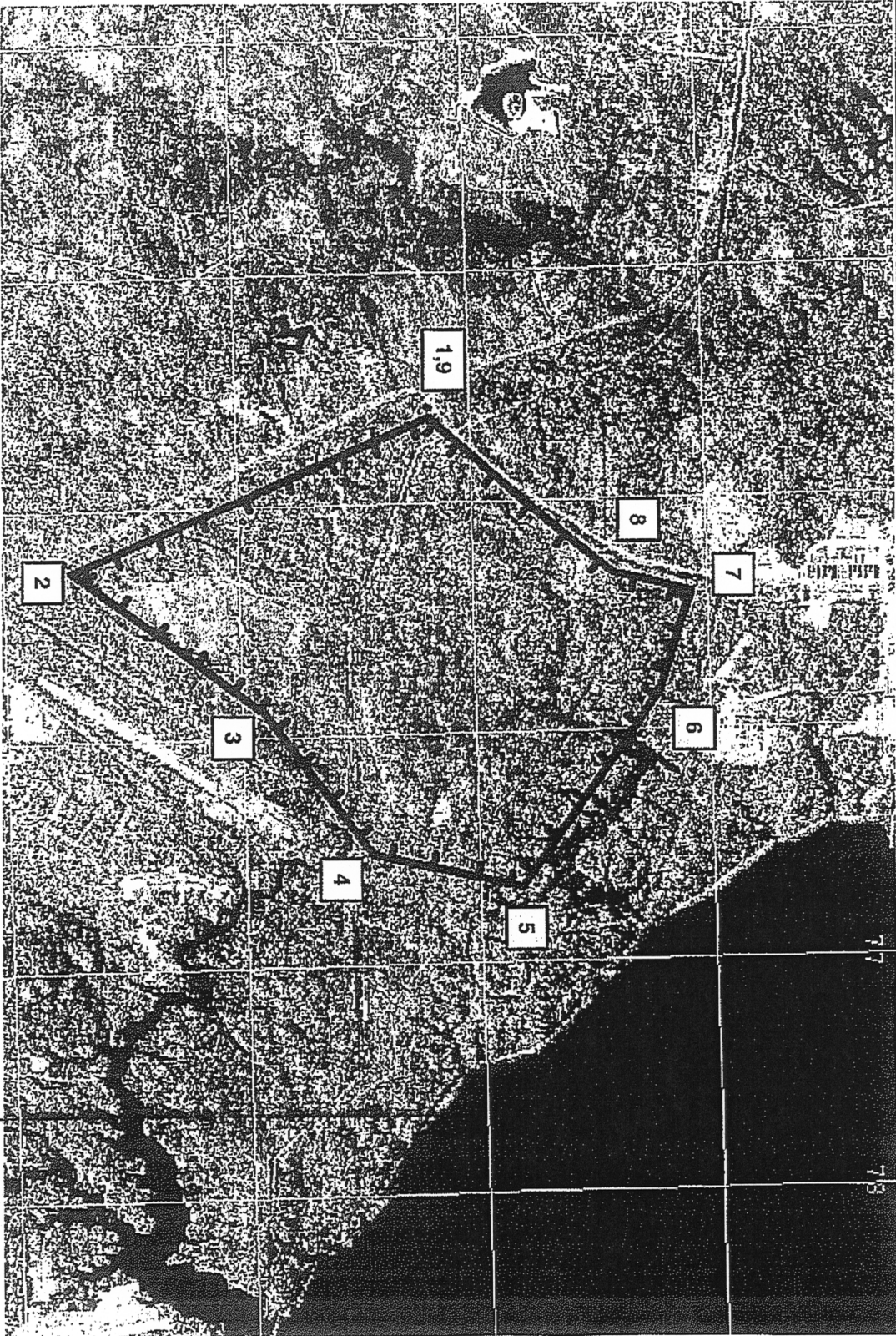


# Stone Bay UAS Area Dimensions

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SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE MARINE CORPS BASE STONE BAY UAS AREA EFFECTIVE



Attachment (1)

UNCLASSIFIED//FOUO



UNCLASSIFIED//FOUO



## Stone Bay UAS Area Dimensions

- Outside Boundary defined by the following grids

1. 18S TD 74634 28828 / N34° 34' 35.55" W077° 27' 24.69"
2. 18S TD 75271 27286 / N34° 33' 46.03" W077° 26' 58.24"
3. 18S TD 75895 28094 / N34° 34' 12.73" W077° 26' 34.56"
4. 18S TD 76525 28543 / N34° 34' 27.78" W077° 26' 10.28"
5. 18S TD 76676 29183 / N34° 34' 48.66" W077° 26' 04.95"
6. 18S TD 75835 29787 / N34° 35' 07.60" W077° 26' 38.50"
7. 18S TD 75416 29932 / N34° 35' 11.97" W077° 26' 55.08"
8. 18S TD 75332 29600 / N34° 35' 01.13" W077° 26' 58.44"
9. 18S TD 74634 28828 / N34° 34' 35.55" W077° 27' 24.69"

- Altitude: SFC – 1199' AGL

SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE MARINE  
CORPS BASE STONE BAY UAS AREA EFFECTIVE

UNCLASSIFIED//FOUO

Attachment (1)

**DoD Class G Notification ASN # 2012-ESA-15-DoD****Proponent Information**

✓ Sponsor:	United States Special Operations Command (USSOCOM)
✓ Attn of:	Mr. Jeff Golliver
✓ Address:	100 Bartley Street
Address 2:	Ste. 110 S
✓ City:	Hurlburt Field
✓ State:	FL
✓ Postal Code:	32544
✓ Telephone:	(850) 884-4064
✓ Email:	Jeffrey.Golliver@Hurlburt.af.mil

**Unit Point of Contact**

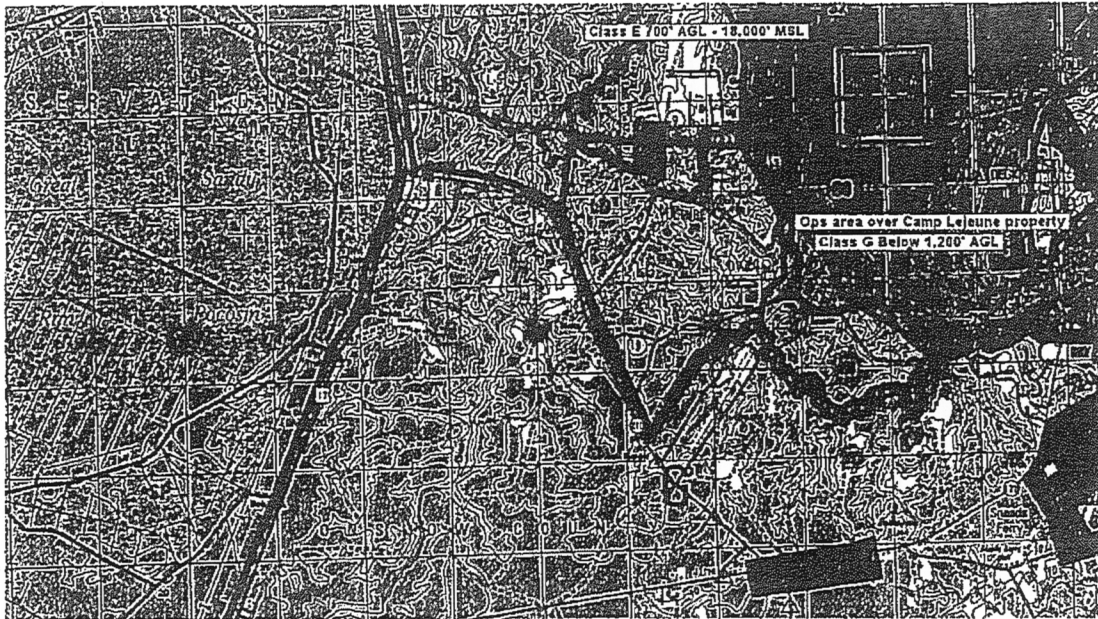
Name:	Alan Tew
Unit:	HQ Air Force Special Operations Command (AFSOC)
Phone:	(850) 884-6333
Email:	Alan.tew.ctr@hurlburt.af.mil

**Declarations**

✓ Declaration (a)	Yes
✓ Declaration (b)	Yes
✓ Declaration (c)	Yes
✓ Declaration (d)	Yes

**Operational Information**

✓ Type Of Unmanned Aircraft:	Wasp, Raven, Puma AE
✓ Latitude/Longitude	34-34-33.00N / 77-26-42.00W
✓ Dates and Times of Operation	
✓ Start	07/01/2012
✓ End	06/30/2013
Map of Operations Area	View Attachment
Remarks	UAS operations conducted by Marine Special Operations Command (MARSOC) will take place in Class G airspace below 1200' AGL. Airspace overlies the Camp Lejeune Military Installation (see attached map). This area is contained within a .75 NM radius of N34 34 33.00/W077 26 42.00 or from the DIW (Dixon NDB/DME) R050/.70 DME. Operations will only take place during official sunrise to sunset and will be IAW the FAA/DoD MOA for operation of UAS in Class G airspace. NOTAMs have been published.



# Selected NOTAMs

The following NOTAM list was selected by the user from a previous request. This list may not reflect all active NOTAMs for any of the below locations.

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Data Current as of: Mon, 02 Jul 2012 12:38:00 GMT

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## KZDC WASHINGTON (ARTCC),DC.

06/520 - AIRSPACE UNMANNED ACFT 1200/BLW .75 NMR DIW050000.7  
DALGT CTC CAMP LEJUNE RANGE CONTROL DUTY OFFICER FREQ 119.5/233.8,  
910-451-3064 EXT 4449 CALL SIGN BLACKBURN. 30 JUN 02:00 2012 UNTIL 30 JUN 02:00  
2013. CREATED: 30 JUN 00:20 2012

Number of NOTAMs selected: 1

End of Report

Cherry Point Global Hawk Letter of Agreement of Jun 26, 2007, Other UAS policy documents may be on file at MCAS Cherry Point, withheld in its entirety under exemption (b) (2), enclosure (8).

Enclosure (8)



Beaufort Global Hawk Letter of Agreement of Jun 15,  
2007; Other UAS policy documents may be on file at MCAS  
Beaufort, withheld in its entirety under exemption  
(b) (2), enclosure (9).

Enclosure (9)

Enclosure (10)

# 1



OFFICE OF THE SECRETARY OF DEFENSE

1480 DEFENSE PENTAGON  
WASHINGTON DC 20301-1480

DOD  
POLICY BOARD  
ON FEDERAL AVIATION

MAY 20 2000

MEMORANDUM FOR ASD(NII) (MR GRIMES)  
OUSD(P) (MR VERGA)  
OUSD(AT&L) (MR KISTLER)  
OSD/DGC A&L (MR LARSEN)  
JCS/J-5 (BGEN DISALVO)  
DCS/G-3/5/7 (LT GEN THURMAN)  
N88 (RADM MYERS)  
DCS/A3/5 (LT GEN DARNELL)  
USMC/AVIATION (LT GEN TRAUTMAN)

SUBJECT: Department of Defense (DoD) Operations and ATC Procedures for Non-Joint-Use  
Airfields with Associated Class D Airspace

I have enclosed DoD operations and ATC procedures to operate DoD Unmanned Aircraft Systems for Service use and implementation. The procedures were developed pursuant to DEPSECDEF memorandum, Subject: Memorandum of Agreement for Operation of Unmanned Aircraft Systems in the National Airspace System dated 24 September 2007. They meet the requirements of the "DoD-FAA MOA Concerning the Operation of DoD UAS in the NAS" entered into by the FAA Administrator and the Deputy Secretary of Defense effective 24 September 2007. The procedures when employed properly will simplify and expedite UAS COA approvals at DoD airfields.

These procedures were developed by Service operations and air traffic control subject matter experts and have been coordinated with the FAA. They should be considered an integral part of DoD airfield operations and attached to all applicable UAS COA requests.

Please feel free to contact me at (703) 695-9067 or COL Allen Baker, who chaired the DoD UAS ATC Procedures Working Group, at (703) 806-4862, with any questions.

Sincerely,

GERALD F. PEASE, Jr., SES  
Executive Director

1 Attachment  
DoD Procedures

## **DOD Operations and ATC Procedures for Non-Joint-Use Airfields with Associated Class D Airspace**

**1. Purpose.** To meet requirements for uniform air traffic control procedures as specified in the DOD/FAA Memorandum of Agreement (MOA) Concerning the Operation of Department of Defense Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS), dated 24 September 07.

### **2. Scope.**

a. The procedures in this document outline standards for DOD operations and ATC procedures at non-joint-use airfields with associated Class D airspace conducting UAS operations.

b. These procedures are supplemental to the procedures in FAAO 7110.65S. They do not waive any ATC procedures specified in the FAAO 7110.65S except where specifically addressed in this document or the Special Provisions listed in the COA.

c. This document cannot be amended without prior coordination with the FAA.

**2. Provisions.** All personnel subject to the requirements of this document shall comply with the following provisions:

a. Applicable Federal, State, and local laws, Service Regulations, applicable Federal Aviation Regulations and orders and the DOD/FAA Memorandum of Agreement Concerning the Operation of Unmanned Aircraft Systems in the National Airspace System (DOD/FAA MOA).

b. Operation of UAS in DOD Class D airspace at non-joint-use airfields is limited to DOD UAS operations and contract operations conducted solely under the direction of Department of Defense or one of its entities.

c. All participating DOD UAS operations shall meet UAS airworthiness certification and UAS pilot/operator/crewmember qualification as outlined in the DOD/FAA MOA.

d. Prior to commencing and at the conclusion of operations, DOD ATC shall advise ATC facilities providing approach control service to the applicable airfield that Unmanned Aircraft (UA) operations are being conducted. Local coordination should be effected with adjacent ATC facilities to include normal, emergency, and contingency operations.

e. If equipped, UAS shall be operated at all times with full lighting and transponders as required by ATC.

f. For the purpose of see-and-avoid, visual observer(s) must be utilized during all UA operations. The visual observer(s) may be either ground-based or in a chase

aircraft. The observer(s) must keep the UA in sight at all times and have two way communications with the UA pilot/operator during all phases of taxi and flight. Communications must be separate from ATC and cannot be on the assigned primary ATC frequency.

g. Operations including lost link will comply with local procedures and will avoid populated areas.

h. DOD will provide briefings to all pilots of participating aircraft. Briefing will include lost link procedures, lost communication procedures, emergency procedures, contingency procedures, standard operating procedures, use of UA Zones and UA Operating Areas.

### **3. Definitions.**

a. Joint-use airfield: A DOD airfield with a contract/agreement with a government entity to sponsor a public airport.

b. Participating aircraft: DOD and DOD-contracted aircraft whose pilots/operators have been fully briefed on UAS operations within a specific Class D airspace and agree to conduct simultaneous operations.

c. Non-participating aircraft: Any aircraft whose pilots/operators have not been briefed on specific procedures for UAS operations within a specific Class D airspace.

d. Intruder aircraft: Any aircraft operating within the Class D airspace without two way radio communication with the ATC facility per 14 CFR Part 91.

e. UA Zones: Published marshalling zones, defined by visual or GPS reference, used by UA and ATC as departure/arrival points to/from airfield. UA Zones are also used for lost link and emergency orbit points for UA.

f. UA Operating Area: Area designated for UA operations within the Class D airspace.

g. UAS VFR holding points: Geographic or GPS based locations to contain the UAS at a specific location.

h. Lost link: UAS pilot/operator has lost the ability to provide real-time control of the UAS. Loss may be permanent or temporary.

i. Lost link procedures: Pre-approved written procedures to be followed by the UAS in the event of lost link. ATC will approve and maintain a copy of all lost link procedures. Lost link procedures may make use of UA zones or UAS VFR holding points.

- j. Lost communications: UAS pilot/operator is not able to communicate with ATC.
- k. Primary radio communications: Recorded communications made between ATC and the UAS pilot/operator on local ATC tower UHF/VHF frequencies.
- l. Alternate communications: Recorded communications made between ATC and the UAS pilot/operator on a ground-to air radio or telephone.
- m. Observer: A person who is responsible to assist the UAS pilot/operator, by visual means, in meeting the requirements of FAR 91.111/113 or 115 and to relay situations that are observed which may cause a collision hazard to other aircraft.

**4. Procedures.** The following procedures will be applied at all non-joint-use DOD-controlled airfields with approved COA. Local procedures will be developed to comply with existing local traffic pattern, arrival, and departure procedures, noise abatement procedures, and airfield operating rules. Local procedures are supplementary to, but cannot waive or replace procedures in this document. Local procedures must be approved by DOD airfield ATC prior to implementation, will be published and maintained in the ATC facilities. Procedures will at a minimum address the areas below and be developed using the following guidance:

a. General Procedures.

(1) All UAS pilots/operators will comply with ATC instructions.

(2) Deconfliction of DOD aircraft will be accomplished by command and control measures.

*NOTE: Command and control will not be used for ATC procedure purposes.*

(3) Deconfliction of UA and nonparticipating traffic or non-DOD aircraft will be accomplished by use of altitude restrictions, visual holding points with specific lateral and vertical limits, use of ground observers or other locally determined procedures.

*NOTE: Use caution when transient aircraft are operating at the same time as UAS. Transient aircrews may not be as familiar with UAS types and operating characteristics, as local crews.*

(4) The UA mission commander shall advise ATC of initiation and completion of flight operations.

(5) Copy of flight schedule will be provided to ATC prior to UA operations. Deconflict manned aircraft and UA to the maximum extent possible in advance.

(6) Radio check between UA pilot/operator and ATC will be conducted prior to operations.

(7) All communications between ATC and UAS pilot/operator will be accomplished on designated primary and/or alternate ATC frequencies. Secondary/backup communications and or telephone connectivity will be precoordinated.

(8) All UAS operations will be conducted under Visual Flight Rules (VFR) in accordance with applicable Service Regulations and FARs. Increased ceiling and visibility requirements can be applied.

(9) A continuing or daily NOTAM will be issued in both the civil and military systems prior to UAS operations by contacting the servicing Automated Flight Service Station.

(10) Airfield commanders/managers will ensure appropriate flight information publications reflect UA operations within their Class D airspace.

b. ATC Procedures.

(1) Description of aircraft types. Describe UAS to other aircraft by stating "unmanned aircraft system." FAAO 7110.65S para. 2-4-21.

(2) ATIS Procedures. Make a new recording when UAS operations are in effect or have terminated for the day. FAAO 7110.65S para. 2-9-2

(3) Light Signals. Light signals will only work with UAS when line of sight with pilot/operator or observer is possible. FAAO 7110.65S para. 3-2-1.

(4) Sequencing and Spacing Application FAAO 7110.65S para. 3-8-1. UAS pilots cannot be instructed to follow another aircraft.

(5) Simultaneous Same Direction, all UAS will be treated as "other" aircraft. FAAO 7110.65S para. 3-8-3.

(6) Same Runway Separation, All UAS will be treated as Category III aircraft. FAAO 7110.65S para. 3-9-6.

(7) Use of Visual Separation between UAS and manned aircraft or UAS and UAS is not authorized. FAAO 7110.65S para. 7-2-1.

(8) SVFR is not authorized with UAS. FAAO 7110.65S para. 7-5-1.

(9) Preventative Control, FAAO 7110.65S para. 3-1-2, may only be applied between multiple UAS operating in a UAS Operating Area.

c. Development of Departure/Arrival/Operations/Emergency Procedures.



(1) UA Zones and VFR holding points will be developed to be used as departure/arrival points to and from the airfield, for lost link orbit points, emergency orbit points, and to assist ATC with spacing and sequencing.

(2) UA Zones will not be used as UA Operating Areas. UA Operating Areas will be developed for use within the Class D airspace.

d. Arrival and Departure Procedures.

Deconflict UA departures from manned aircraft using one or more of the following methods:

(1) Spatial or geographic separation

- UA only arrival/departure points
- Segregate UA departure runways/strips from primary manned aircraft runway (e.g. designated UA runway/taxiway, outlying operating area or launch trajectory).

(2) Time

(3) Holding of manned aircraft during UA arrivals/departures

(4) Hold the UAS

(5) Scheduling procedures

e. Pattern Procedures.

(1) UA will be segregated from manned aircraft utilizing one or more of the following:

- Altitude (minimum 500' vertical separation)
- Direction of traffic
- Distance from manned pattern (minimum of 1 SM)

(2) Simultaneous or concurrent use of the same traffic pattern with manned aircraft should only be done to correct or prevent an unsafe situation.

(3) All UAS will be treated as small aircraft for the purpose of applying wake turbulence rules until official UAS weight classes are determined by DOD. In addition to the requirements of FAO 7110.65S, ATC will apply the following procedures:

a) Issue cautionary wake turbulence advisories, and the position, altitude, and direction of flight to the pilot/operator of UAS landing behind all manned aircraft regardless of weight class. FAAO 7110.65S para. 2-4-21.

b) Wake Turbulence Rules cannot be waived by the UAS pilot/operator.

f. Night Operations Procedures.

(1) Night operations may be conducted if radar is used to augment observers. ATC will notify UA pilot/operators of any observed radar traffic that may enter the Class D airspace.

(2) For those airfields without radar coverage, night operations will not be conducted unless mitigation procedures for limited capabilities of observer at night is addressed and approved in COA.

g. Non-participating Aircraft Procedures. ATC will keep the UA pilot/operator apprised of any known nonparticipating aircraft operations that may impact operations. UA pilot/operator will take all necessary actions to maintain lateral and visual separation. Workload permitting, ATC should provide UA pilot/operator recommended altitudes or direct to predetermined points (UA Zones) to ensure deconfliction.

h. Intruder Aircraft Procedures.

(1) ATC will notify UA pilot/operators of any known intruder aircraft.

(2) ATC will broadcast on emergency frequencies when an intruder aircraft is present to expeditiously establish two-way radio communications with intruder aircraft.

(3) UAS pilot/operator, assisted by ATC, will determine best method to separate UAS and intruder aircraft. Examples of separation methods:

- UA may proceed to a UA Zone to hold
- Cease operations and land if it will not aggravate the situation
- Altitude deconfliction

*NOTE: Intruder aircraft will be reported to the FAA in the most expeditious manner.*

i. Emergency Procedures.

(1) UA pilot/operators will report all in-flight emergencies to ATC as soon as possible.

- Procedures to address loss of/limited controllability will make use of remote UA Zones and uninhabited areas.
- Procedures for engine malfunctions will consider engine failure during recovery.

*NOTE: UAS emergencies may not require Crash-Rescue services. The UA pilot/operator will advise ATC of required support.*

(2) ATC will apply the procedures listed in Chapter 10, Section 1 of FAAO 7110.65S. Minimum required information for in-flight emergencies:

- Aircraft identification and type
- Nature of the emergency (lost link, equipment failure)
- Intentions of the UA pilot/operator
- Aircraft altitude / position
- Fuel remaining in time

(3) During an emergency, safety of manned aircraft will be given priority.

(4) UAs within Class D airspace will be directed by ATC to land or proceed to assigned UA Zone and hold until further instructions are given by ATC.

(5) If primary radio communications between UA pilot/operator and ATC are lost, UA pilot/operator or ATC will be notified immediately via designated alternate communications method. Failure to establish or maintain radio communication between UA pilot/operator and ATC will require termination of UA operations.

(6) If lost link occurs, UAS pilot/operator will immediately notify ATC with the following information:

- a) Time of lost link
- b) Last known position
- c) Altitude
- d) Direction of flight
- e) Confirm execution of lost link procedures
- f) Confirm pilot/observer have visual contact with UA.

*NOTE: UA lost link is an emergency, but may not require Crash-Rescue services*

(7) If communications are lost between UAS pilot/operator and observer, the UAS pilot/operator will immediately notify ATC and attempt to re-establish communications.. Failure to regain communication between UA pilot/operator and observer will require termination of UAS operation. This procedure must be addressed in local procedures.

(8) In the event of permanent lost link, lost communication between UAS pilot/operator and ATC or lost communication between UAS pilot/operator and observer, ATC will do the following:

- a) Cease aircraft launches until status of affected UAS is determined
- b) Recover other UA as appropriate
- c) Issue advisories and ATC instructions as appropriate to insure the safe operation of all aircraft

(9) If UA observer loses visual/situational awareness of the UA, ATC will be notified immediately. If visual observation cannot be established, the flight shall be terminated.

Enclosure (11)



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

**North Carolina Airspace Study**

**Unmanned Aerial Systems**

**Task Force Meeting No. 1 – 10:00AM – Thursday, June 9, 2011**

**Office of the Secretary**

**Location:**

NCDOT – Downtown Raleigh  
1 South Wilmington St. Raleigh, NC 27601  
Main Conference Room – No. 150

**Purpose:**

To establish North Carolina as an industry leader in accommodating Unmanned Aircraft Systems (UAS) by establishing a suitable UAS test site for attracting businesses and jobs to the state.

**Agenda:**

1. Introductions – Name, Title, Company
2. Program Overview – Purpose, Benefits, Job Opportunities
3. Goal of the Study – Established Airspace for UAS
4. General Project Approach – Needs & Requirements, Available Airspace / Sites, Operations, Cooperative Agencies, Supporting Industries
5. Open Discussion
6. Schedule – Action Items
7. Schedule Next Meeting – July 14, 2011, 10:00 AM?

**MAILING ADDRESS:**

NC DEPARTMENT OF  
TRANSPORTATION  
DIVISION OF AVIATION  
1560 MAIL SERVICE CENTER  
RALEIGH NC 27699-1560

TELEPHONE: 919-840-0112

FAX: 919-840-9267

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**

RDU AIRPORT  
1050 MERIDIAN DRIVE  
RDU NC 27623

NC UAS TF Trip Report Jun 9, 2011, withheld in its entirety under exemption (b) (5) pre-decisional, enclosure (12).

Enclosure (12)



NC UAS TF Trip Report Mar 27, 2012 withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (13).

Enclosure (13)

NC UAS TF Trip Report Jul 19, 2012 withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (14).

Enclosure (14)

Enclosure (5)

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**CERTIFICATE OF WAIVER OR AUTHORIZATION**

## ISSUED TO

United States Marine Corps

Marine Unmanned Aerial Vehicle Squadron Two (VMU-2)

PSC box 8977

MCAS Cherry Point, NC 28533

Attn: Commanding Officer, VMU-2

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

## OPERATIONS AUTHORIZED

Operation of the Shadow RQ-7B Unmanned Aircraft System (UAS) in Class D & E airspace at over the Cherry Point MCAS to R-5306C/D under the jurisdiction of the Cherry Point Approach Control

## LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

N/A

**STANDARD PROVISIONS**

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

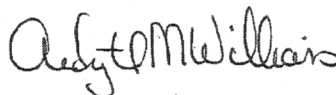
Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

**SPECIAL PROVISIONS**

Special Provisions are set forth and attached.

This certificate 2011-ESA-71 is effective from December 9, 2011 to December 8, 2012, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR



FAA Headquarters, AJV-13

(Region)

For: M. Randy Willis

(Signature)

December 9, 2011

(Date)

Acting Manager, Unmanned Aircraft Systems

(Title)

**ATTACHMENT to FAA FORM 7711-1**

**Issued To:** United States Marine Corps

**Address:** Marine Unmanned Aerial Vehicle Squadron Two (VMU-2)  
PSC box 8977  
MCAS Cherry Point, NC 28533  
Attn: Commanding Officer, VMU-2

**Activity:** Operation of the Shadow RQ-7B Unmanned Aircraft System (UAS) in Class D & E airspace at over the Cherry Point MCAS to R-5306C/D under the jurisdiction of the Cherry Point Approach Control.

**Purpose:** To prescribe UAS operating requirements (outside of restricted and/or warning area airspace) in the National Airspace System (NAS) for the purpose of training and/or operational flights.

**Dates of Use:** This Certificate of Authorization (COA) 2011-ESA-71 is valid from December 9, 2011 through December 8, 2012. Should a renewal become necessary, the proponent shall advise the Federal Aviation Administration (FAA), in writing, no later than 60 days prior to the requested effective date.

**General Provisions:**

- The review of this activity is based on our current understanding of UAS operations, and the impact of such operations in the NAS, and therefore should not be considered a precedent for future operations. As changes occur in the UAS industry, or in our understanding of it, there may be changes to the limitations and conditions for similar operations.
- All personnel connected with the UAS operation must comply with the contents of this authorization and its provisions.
- This COA will be reviewed and amended as necessary to conform to changing UAS policy and guidance.

**Safety Provisions:**

Unmanned Aircraft (UA) have no on-board pilot to perform see-and-avoid responsibilities, and therefore, when operating outside of restricted areas, special provisions must be made to ensure an equivalent level of safety exists for operations had a pilot been on board. In accordance with 14 CFR Part 91, General Operating and Flight Rules, Subpart J-Waivers, 91.903, Policy and Procedures, the following provisions provide acceptable mitigation of 14 CFR Part 91.111/113 and must be complied with:

- For the purpose of see-and-avoid, visual observers must be utilized at all times except in Class A airspace, restricted areas, and warning areas. The observers may either be ground based or in a chase plane. If the chase aircraft is operating more than 100ft above/below and or ½ nm laterally, of the UA, the chase aircraft PIC will advise the controlling ATC facility.
- In order to comply with the see and avoid requirements of Title 14 of the Code of Federal Regulations sections 91.111 and 91.113, the pilot-in-command and visual observers must be able to see the aircraft and the surrounding airspace throughout the entire flight; and be able to determine the aircraft's altitude, flight path and proximity to traffic and other hazards (terrain, weather, structures) sufficiently to exercise effective control of the aircraft to give right-of-way to other aircraft, and to prevent the aircraft from creating a collision hazard.
- UAS pilots will ensure there is a safe operating distance between manned and unmanned aircraft at all times in accordance with 14 CFR 91.111, *Operating Near Other Aircraft*, and 14 CFR 91.113, *Right-of-Way Rules*. Cloud clearances and VFR visibilities for Class E airspace will be used regardless of class of airspace. Additionally, UAS operations are advised to operate well clear of all known manned aircraft operations.
- The dropping or spraying of aircraft stores, or carrying of hazardous materials (included ordnance) outside of active Restricted, Prohibited, or Warning Areas is prohibited unless specifically authorized in the Special Provisions of this COA.

#### **Airworthiness Certification Provisions:**

- UA must be shown to be airworthy to conduct flight operations in the NAS.
- Public Use Aircraft must contain one of the following:
  - A civil airworthiness certification from the FAA, or
  - A statement specifying that the Department of Defense Handbook "Airworthiness Certification Criteria" (MIL-HDBK-516), as amended, was used to certify the aircraft or
  - Equivalent method of certification.

#### **Pilot / Observer Provisions:**

- **Pilot Qualifications:** UA pilots interacting with Air Traffic Control (ATC) shall have sufficient expertise to perform that task readily. Pilots must have an understanding of and comply with Federal Aviation Regulations and Military Regulations applicable to the airspace where the UA will operate. Pilots must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA pilots.
- Aircraft and Operations Requirements:
  - Flight Below 18,000 Feet Mean Sea Level (MSL).
    - UA operations below 18,000 feet MSL in any airspace generally accessible to aircraft flying in accordance with visual flight rules (VFR) require visual

- observers, either airborne or ground-based. Use of ATC radar alone does not constitute sufficient collision risk mitigation in airspace where uncooperative airborne operations may be conducted.
- Flights At or Above 18,000 Feet Mean Sea Level (MSL)
    - When operating on an instrument ATC clearance, the UA pilot-in-command must ensure the following:
      1. An ATC clearance has been filed, obtained and followed.
      2. Positional information shall be provided in reference to established NAS fixes, NAVAIDS, and waypoints. Use of Latitude/Longitude is not authorized.
  - **Observer Qualifications:** Observers must have been provided with sufficient training to communicate clearly to the pilot any turning instructions required to stay clear of conflicting traffic. Observers will receive training on rules and responsibilities described in 14 CFR 91.111, *Operating Near Other Aircraft*, 14 CFR 91.113, *Right-of-Way Rules*, cloud clearance, in-flight visibility, and the pilot controller glossary including standard ATC phraseology and communication. Observers must have in their possession a current second class (or higher) airman medical certificate that has been issued under 14 CFR 67, Medical Standards and Certification, or a military equivalent. 14 CFR 91.17, Alcohol or Drugs, applies to UA observers.
  - **Pilot-in-Command (PIC) –**
    - **Visual Flight Rules (VFR) as applicable:**
      - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
      - The PIC operating a UA in line of sight must pass at a minimum the required knowledge test for a private pilot certificate, or military equivalent, as stated in 14 CFR 61.105, and must keep their aeronautical knowledge up to date.
      - There is no intent to suggest that there is any requirement for the UAS PIC to be qualified as a crewmember of a manned aircraft.
      - Pilots flying a UA on other than instrument flight plans beyond line of sight of the PIC must possess a minimum of a current private pilot certificate, or military equivalent in the category and class, as stated in 14 CFR 61.105.
    - **Instrument Flight Rules (IFR) as applicable:**
      - The PIC is the person directly responsible for the operation of the UA. The responsibility and authority of the pilot in command as described by 14 CFR 91.3 (or military equivalent), applies to the UAS PIC.
      - The PIC must be a certified pilot (minimum of private pilot) of manned aircraft (FAA or military equivalent) in category and class of aircraft flown.
      - The PIC must also have a current/appropriate instrument rating (manned aircraft, FAA or military equivalent) for the category and class of aircraft flown.
  - **Pilot Proficiency – VFR/IFR as applicable:**



- Pilots will not act as a VFR/ IFR PIC unless they have had three qualified proficiency events within the preceding 90 days.
  - The term “qualified proficiency event” is a UAS-specific term necessary due to the diversity of UAS types and control systems.
  - A qualified proficiency event is an event requiring the pilot to exercise the training and skills unique to the UAS in which proficiency is maintained.
- Pilots will not act as an IFR PIC unless they have had six instrument qualifying events in the preceding six calendar months (an event that requires the PIC to exercise instrument flight skills unique to the UAS).
- **PIC Responsibilities:**
  - Pilots are responsible for a thorough preflight inspection of the UAS. Flight operations will not be undertaken unless the UAS is airworthy. The airworthiness provisions of 14 CFR 91.7, Civil Aircraft Airworthiness, or the military equivalent, apply.
  - One PIC must be designated at all times and is responsible for the safety of the UA and persons and property along the UA flight path.
  - The UAS pilot will be held accountable for controlling their aircraft to the same standards as the pilot of a manned aircraft. The provisions of 14 CFR 91.13, *Careless and Reckless Operation*, apply to UAS pilots.
- **Pilot/Observer Task Limitations:**
  - Pilots and observers must not perform crew duties for more than one UA at a time.
  - Chase aircraft pilots must not concurrently perform either observer or UA pilot duties along with chase pilot duties.
  - Pilots are not allowed to perform concurrent duties both as pilot and observer.
  - Observers are not allowed to perform concurrent duties both as pilot and observer.

**Standard Provisions:** These provisions are applicable to all operations unless indicated otherwise in the Special Provisions section.

- The UA PIC will maintain direct two-way communications with ATC and have the ability to maneuver the UA per their instructions, unless specified otherwise in the Special Provisions section. The PIC shall comply with all ATC instructions and/or clearances.
- If equipped, the UA shall operate with an operational mode 3/A transponder, with altitude encoding, or mode S transponder (preferred) set to an ATC assigned squawk.
- If equipped, the UA shall operate with position/navigation lights on at all times during flight.
- The UA PIC shall not accept any ATC clearance requiring the use of visual separation or sequencing.

- VFR cloud clearances and visibilities for Class E airspace will be used regardless of class of airspace the UAS is operating in, except when operating in Class A airspace where 14 CFR Part 91.155 will apply.
- Special VFR is not authorized.
- Operations (including lost link procedures) shall not be conducted over populated areas, heavily trafficked roads, or an open-air assembly of people.
- Operations outside of restricted areas, warning areas, prohibited areas (designated for aviation use) and/or Class A airspace may only be conducted during daylight hours, unless authorized in the Special Provisions section.
- Operations shall not loiter on Victor airways, Jet Routes, Q Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.
- Operations conducted under VFR rules shall operate at appropriate VFR altitudes for direction of flight (14 CFR 91.159).
- The UA PIC or chase plane PIC (whichever is applicable) will notify ATC of any in flight emergency or aircraft accident as soon as practical.
- All operators that use GPS as a sole source must check all NOTAMs and Receiver Autonomous Integrity Monitoring (RAIM). Flight into GPS test area or degraded RAIM is prohibited without specific approval in the special provisions.
- At no time will TCAS be used in any mode while operating an unmanned aircraft.
- Only one UA will be flown in the operating area unless indicated otherwise in the Special Provisions.
- A copy of this COA will be maintained on site by the PIC or designated representative.
- The USMC, and/or its representatives, is responsible at all times for collision avoidance with non-participating aircraft and the safety of persons or property on the surface with respect to the UAS.

**Special Provisions:**

1. In the event of a lost link, the UAS pilot will immediately notify Cherry Point Control Tower via land line, state pilot intentions, and comply with the following provisions:
  - a. Operations within the Class D: Lost link procedures direct the UAS to fly to the NKT 360 degree radial at 4 DME at an altitude of 2000' and hold. The Mission Commander will immediately contact the tower controller via radio and inform them of lost link condition as well as the preprogrammed routing of the aircraft.
  - b. Operations within the R5306A/C: Lost link procedures direct the UAS to fly to the Piney Island military range complex (BT-11) at an altitude of 2000' and hold. BT 11 is located inside the R5306A/C (NKT 074/24) and is uninhabited except for a small contingent of range controllers and range maintenance personnel. BT-11 airspace extends from the surface to 17,999 ft AGL. The Mission Commander will immediately contact Cherry Targets via land line and inform them of lost link condition as well as the preprogrammed routing of the aircraft.

- c. Operations within the NAS transiting to/from Class D airspace to/from R5306A/C airspace. Once the UA has departed the either the Class D or R5306A/C if a lost link occurs the UA will continue on its current route until reaching its programmed destination. Once within either the Class D airspace or the R5306A/C Airspace the UA will follow the procedures listed in paragraph 5 a or b above which ever is applicable. The Mission Commander will immediately contact Cherry Point RADAR via radio and inform them of lost link condition as well as the preprogrammed routing of the aircraft.
- d. In the event that the link cannot be restored with the UAS during the predetermined holding period, the Flight Termination System (FTS) will be activated to allow for a controlled recovery. The FTS is an emergency system comprised of a recovery parachute that can be deployed from either the control station or by the aircraft once a pre-determined set of conditions have been met. Its function is to safely recover the air vehicle with minimum damage to the air vehicle, persons or property during an emergency flight termination.
2. Operations shall not be operated over populated areas, heavily trafficked roads, or an open-air assembly to include lost link procedures.
  3. Special VFR operations are not authorized.
  4. The United States Marine Corps has determined the airworthiness and safety of the Shadow RQ-7B UAS and submitted a letter stating such dated April 20, 2011. The aircraft must be operated in strict compliance with all provisions and conditions in this Airworthiness Release. (n addition, all normal and emergency procedures as outlined in the COA on-line application must be followed.
  5. Operations will remain within the confines of the operating areas defined in the COA on-line application
  6. Use of visual observers in a linear fashion away from the control station (daisy chaining) *is* authorized provided the Visual Observer Operating Procedures stated in the COA application are followed
  7. A pilot-in-command (PIC) must be designated prior to launch of the aircraft and must be at the controls or have access to the controls of the unmanned aircraft at any point during the flight.
  8. The PIC must conduct a pre-takeoff briefing on the contents of the CGA, maximum altitude to be flown, frequencies to be used, lost link procedures,

hazards unique for the flight to be flown, emergency procedures on takeoff and landing, and any special provisions.

9. The PIC and visual observer(s) must receive training under the direct supervision of a qualified instructor.
10. For night operations, the following limitations must be followed:
  - o UAS night operations are those operations that occur between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time. (NOTE: This is equal to approximately 30 minutes after sunset until 30 minutes before sunrise.)
  - o UAS launch and recovery operations will take place wholly within MCAS Cherry Point Class D airspace while the air traffic control (ATC) tower is open and the Class D is active.
  - o External pilots and UAS ground observer(s) must be in place 30 minutes prior to night operations to ensure dark adaptation.
  - o The Shadow RQ-7B unmanned aircraft will operate navigation and strobe lights for all night operations while in the MCAS Cherry Point Class D airspace. Night operations are prohibited if the UAS lights are inoperative.
  - o Ground observers will undergo additional training on the lighting configuration of the Shadow RQ-7B to ensure proper recognition during night flight.
11. The mixing of civil manned and unmanned traffic within MCAS Cherry Point Class D airspace during launch and recovery operations is prohibited.
12. The proponent or delegated representative is responsible for halting or cancelling unmanned aircraft activity if, at any time, the safety of persons or property on the ground or in the air is jeopardized, or if there is a failure to comply with the provisions of the authorization
13. A frequency integrity check must be conducted prior to the launch of the Shadow RQ-7B unmanned aircraft:.
14. Sterile cockpit procedures must be observed during all critical phases of flight to including all ground operations involving taxi, takeoff, landing, and all other flight operations in which safety or mission accomplishment might be compromised by distractions.
15. The use of cell phones or other electronic devices is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with ATC.

16. ATC must be immediately notified in the event of any emergency, loss and subsequent restoration of command link or any other malfunction or occurrence that would impact air traffic safety or operations.
17. The PIC must have at least a current FAA private pilot's certificate or the FAA accepted agency equivalent, based on the application or Title 14 of the Code of Federal Regulations Part 61 for any operations above 400 feet AGL in Class G airspace, and all operations in Class D and E airspace.

**NOTAM:** A distance (D) Notice to Airmen shall be issued when UA operations are being conducted. This requirement may be accomplished through your local base operations or NOTAM issuing authority. You may also complete this requirement by contacting Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 48 hours prior to the operation and provide:

- Name and Address of pilot filing NOTAM request
- Location, Altitude or the operating Area
- Time and nature of the activity

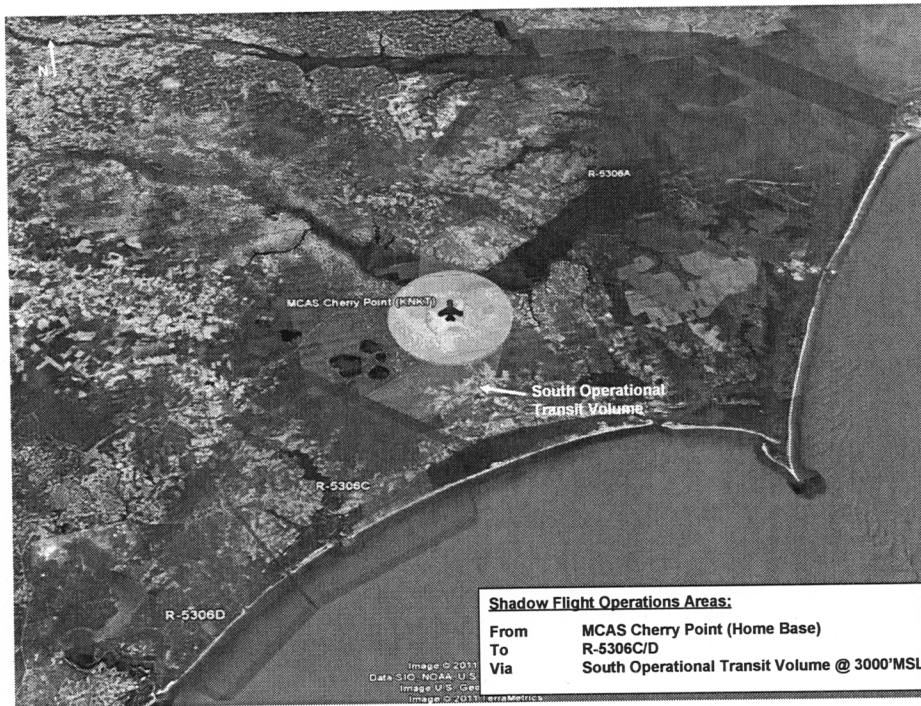
**NOTE FOR PROPONENTS FILING THEIR NOTAM WITH DoD ONLY:** This requirement to file with the AFSS is in addition to any local procedures/requirements for filing through DINS. The FAA Unmanned Aircraft Systems Office is working with the AFSS, and to eliminate the requirement to file a NOTAM with both the AFSS and DINS in the near future.

**Incident / Accident and Normal Reporting Provisions:** The following information is required to document routine and unusual occurrences associated with UAS activities in the NAS.

- The proponent for the COA shall provide the following information to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) on a monthly basis:
  - Number of flights conducted under this COA.
  - Pilot duty time per flight.
  - Unusual equipment malfunctions (hardware/software).
  - Deviations from ATC instructions.
  - Operational/coordination issues.
  - All periods of loss of link (telemetry, command and/or control)
- The following shall be submitted via COA Online, email or phone (202-385-4542, cell 443-569-1732) to [Donald.E.Grampp@faa.gov](mailto:Donald.E.Grampp@faa.gov) **within 24 hours and prior to any additional flight under this COA:**
  - All accidents or incidents involving UAS activities, including lost link.
  - Deviations from any provision contained in the COA.

This COA does not, in itself, waive any Federal Aviation Regulation (FAR) nor any state law or local ordinance. Should the proposed operation conflict with any state law or

local ordinance, or require permission of local authorities or property owners, it is the responsibility of the USMC to resolve the matter. This COA does not authorize flight within Special Use Airspace without approval from the Using Agency. The USMC is hereby authorized to operate the Shadow Unmanned Aircraft System in the operations area depicted in "Activity" above and attachment 1 below.





Enclosure (6)



DEPARTMENT OF THE NAVY  
NAVAL AIR SYSTEMS COMMAND  
RADM WILLIAM A. MOFFETT BUILDING  
47123 BUSE ROAD, BLDG 2272  
PATUXENT RIVER, MARYLAND 20670-1547

IN REPLY REFER TO

13610  
Ser AIR-4.1/11-041  
10 Jun 2011

From: Director, Systems Engineering Department, AIR-4.1, 22347 Cedar Point Road, Building 2185, Suite 1232, Patuxent River, MD 20670-1907

To: PEO (U&W), Attn: PMA-262, 47123 Buse Road, Building 2272, Suite 246, Patuxent River, MD 20670-1547

Subj: SAFE FOR USE CERTIFICATION FOR GROUND BASED SENSE AND AVOID (GBSAA) SYSTEM, MARINE CORPS AIR STATION (MCAS) CHERRY POINT, NORTH CAROLINA IN SUPPORT OF VMU-2 RQ-7B OPERATIONS

Ref: (a) Mtg btwn AIR-4.0, 4.0P, 4.1 of 11 Feb 2011  
(b) Commander, PMA-262, Safe For Use Certification Request of GBSAA System at MCAS Cherry Point, NC in Support of VMU-2, RQ-7B Operations, E-mail MSG ID NAEAPAXREZ02-110606221552Z-16548  
(c) GBSAA Configuration Document, MCAS Cherry Point, Doc. No. GSC 25, Version 1.0, Dtd June 3, 2011  
(d) GBSAA Operations and Procedures Manual, MCAS Cherry Point, Doc. No. GSC14, Version 1.5, Dtd June 3, 2011  
(e) NAVAIR System Safety Risk Assessment Matrix, AIR-4.0 letter 5100 Ser AIR-4.0/026, 14 Feb 2011  
(f) System Safety Assessment – Residual Risk Acceptance, CP GBSAA Mid-Air Collision (MAC) Hazard Risk, 01 Jun 2011  
(g) MCAS Cherry Point, VMU-2, Request for Certificate of Authorization (COA) ASN #2011-ESA-37-COA

1. Reference (a) delegated technical authority for the certification of airspace integration (sense and avoid) for unmanned systems under Naval Air Systems Command cognizance to the Director, AIR-4.1 on behalf of the Commander, Naval Air Systems Command.
2. In response to reference (b), Safe for Use Certification is granted for the Ground Based Sense and Avoid System in support of VMU-2 RQ-7B Shadow UAS day and night flight operations at MCAS Cherry Point, North Carolina.
3. Configuration: Baseline configuration in accordance with reference (c).
4. Limitations: MCAS Cherry Point GBSAA Operations are authorized in accordance with reference (d) and RQ-7B Flight Clearance associated with reference (g) approved COA. The MCAS Cherry Point GBSAA system is subject to the limitations in references (d) and (g) and the following (the most restrictive applies unless otherwise stated):
  - a. GBSAA system is authorized for use only for VMU-2, RQ-7B UAS operations transiting through the Operational Transit Volumes (OTV), between the MCAS Cherry Point, North Carolina, Class D Surface Area (CDSA) and R-5306 A/C/D restricted areas as defined in reference (d).
  - b. Class E Airspace Altitude limits: Minimum: 2600 ft AGL, Maximum: 3600 ft AGL.

Subj: SAFE FOR USE CERTIFICATION FOR GROUND BASED SENSE AND AVOID (GBSAA) SYSTEM, MARINE CORPS AIR STATION (MCAS) CHERRY POINT, NORTH CAROLINA IN SUPPORT OF VMU-2 RQ-7B OPERATIONS

- c. OTV Minimum Transit Speed limit: After climb to OTV transit altitude, the UA shall maintain a minimum 90 kt ground speed to and from MCAS Cherry Point, CDSA.
- d. Entry into the OTV is prohibited under GBSAA if a red or yellow alert exists, or if the system connectivity indicator is not rotating.
- e. Only one OTV may be active at a time for GBSAA operations.
- f. Only one UA at a time may transit through the active OTV when conducting GBSAA operations.

5. Warnings, Cautions and Notes: In accordance with reference (d).

-----NOTE-----

- a. VMU-2 UAC, MCAS Cherry Point ATC and the GBSAA operator should closely coordinate OTV transit operations prior to each mission.

6. Time Period: This Safe for Use Certification expires not later than 18-months from the effective date of this certification.

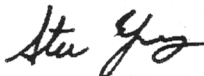
7. Points of Contact:

- a. Paul Frederick, AIR 4.1.1.5, PMA-262 Airspace Integration APMSE, Tel: (301) 757-5850, E-mail: paul.frederick@navy.mil
- b. Kevin Warren, Contract Support for AIR 4.1.1.5, PMA-262 Airspace Integration, Tel (301) 757-9217, E-mail: kevin.e.warren.ctr@navy.mil
- c. Susie Larson, Contract Support for AIR 4.1.1.5, PMA-262 Airspace Integration, Tel (301) 757-2441, E-mail: mariasusita.larson1.ctr@navy.mil

8. Other Remarks:

- a. GBSAA system use is contingent upon operational and system safety data collection and analysis as required in reference (f). Prior to reauthorization of the GBSAA system at the end of the expiration period, the safety risk assessment will be updated based on reference (f) data collection and analysis, and any required risk mitigations implemented.
- b. A medium risk hazard (categorized IAW reference (e)) has been identified with the system that is relevant to this Safe for Use Certification. Reference (f) documents acceptance of this risk by PMA-262.
- c. The GBSAA system is not intended to provide "see and avoid" risk mitigation to Cherry Point CDSA or surrounding Restricted Areas.
- d. This certificate provides NAVAIR safe for use certification subsequent to an engineering and system safety hazard review consistent with the proposed use and operational restrictions to ensure safety of flight and to reduce the risk to people, property, and/or environment.
- e. This certification does not authorize system modification. Contact paragraph 7.a, 7.b, or 7.c for policy guidance on configuration management and modification authority.
- f. Contact paragraph 7.a, 7.b, or 7.c for information regarding this certification.

9. For any questions, please call me at (301) 757-2328 or any of the points of contact listed above.



D. S. YOUNG  
SES Director, Systems Engineering Department

Enclosure (7)



#6

Marine Corps Forces Special Operations Command,  
2d Marine Aircraft Wing,  
Marine Corps Base Camp Lejeune, Marine Corps Air Station New River,  
and Marine Corps Air Station Cherry Point

LETTER OF AGREEMENT (LOA)

Effective: JUL 07 2011

SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

1. PURPOSE. To set forth procedures for UAS operations in the Stone Bay UAS Area.

2. CANCELATION. None.

3. SCOPE. The procedures herein shall apply to Marine Corps Forces Special Operations Command (MARSOC), 2d Marine Aircraft Wing (2d MAW), Marine Corps Base (MCB) Camp Lejeune, Marine Corps Air Station (MCAS) New River, and MCAS Cherry Point when UAS operations are being conducted in the Stone Bay UAS Area as depicted in Attachment 1. These procedures complement Marine Corps Base Camp Lejeune BO 3570.1 and JO 7110.65, and are in accordance with the instructions specified by the reference.

4. RESPONSIBILITIES

a. MARSOC is responsible for ensuring that the Class G Notification is renewed annually through USSOCOM.

b. MARSOC via USSOCOM is responsible for publishing the appropriate Notice To Airmen (NOTAM) concerning operations of UAS flights in the Stone Bay UAS Area. Additionally, MARSOC is solely responsible for scheduling and coordination for the Stone Bay UAS area with Marine Corps Base Range Control. 2d MAW will ensure that all subordinate commands are formally notified about the activation of the Stone Bay UAS area via Automated Message Handling System (AMHS) and Read and Initial.

c. Marine Corps Base Camp Lejeune Range Control Division (RCD) is ~~responsible for resolving scheduling conflicts and for notifying real~~ time activation and deactivation with Cherry Point and New River Air Traffic Control. RCD shall be responsible for notifying all range users of the current status of the Stone Bay UAS area when required.

d. Though VFR aircraft are not prohibited from flight within Class G airspace, MCAS Cherry Point and MCAS New River will be responsible to advise aircraft under their control when the Stone Bay UAS Area is in use.

Subj: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

5. PROCEDURES:

a. MARSOC shall:

(1) Use Range Facility Management Support System (RFMSS) to schedule the Stone Bay UAS Area with Marine Corps Base RCD not more than 90 days in advance and not less than 48 hours in advance.

(2) Provide a qualified Range Officer In Charge (ROIC) and Range Safety Officer (RSO). The ROIC will sign for the training area at Range Control.

(3) Plan and conduct all UAS operations using MCAS New River official weather reports. UAS operations are not authorized when MCAS New River official weather report is less than 1000 foot ceiling and/or three miles visibility.

(4) Establish and maintain radio communication with range control at all times.

(5) Contact Range Control, call sign "Blackburn", before commencing operations and immediately after securing operations at the Stone Bay UAS area. Primary frequency is 34.70, secondary is 40.10. Squelch must be turned off. When primary and secondary frequencies are out of service, call Blackburn at 910-451-3064 primary or 910-451-4449 secondary. All communications will be recorded.

(6) Maintain a visual observer who is not part of the UAS flight crew any time an Air Vehicle (AV) is airborne.

(7) Immediately notify Range Control of any lost link or MARSOC AV mishap.

(8) Immediately notify Range Control when a UAS inadvertently departs from or spills out of the Stone Bay UAS area.

b. MCB Camp Lejeune RCD shall:

(1) Notify MCAS Cherry Point and MCAS New River when Stone Bay UAS area is activated and deactivated.

(2) Issue advisories when Stone Bay UAS Area is in use.

(3) Inform MCAS New River and MCAS Cherry Point whenever a UAS has exited the Stone Bay UAS area.

c. MCAS New River and MCAS Cherry Point shall issue a Stone Bay UAS Area advisory to aircraft under their control that may be affected.

Subj: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS AREA

6. GENERAL:

a. The conditions of the Class G Notification are contained in Attachment 2. The actual Class G Notification will be implemented upon signature of this document. Class G Notifications will be effective for a period of 12 months from the date activated. MARSOC will disseminate the active Class G Notification by separate correspondence.

b. Deviation from the responsibilities and procedures outlined in this agreement may be effected only after coordination that clearly defines the responsibilities in each case. The terms of the Class G Notification in effect and subsequent updates may not be changed by local agencies.

c. The MARSOC UAS Program Manager shall maintain responsibility for this LOA.

d. UAS operations may be temporarily suspended during higher priority operations such as emergencies, MED EVAC, search and rescue and flight checks.

e. This LOA shall be reviewed annually by all signatories and shall be updated at least every five years from the effective date; sooner as may be required to conform to appropriate guidelines, subsequent FAA rulings and/or in response to lessons learned. Any permanent changes or modifications shall be executed in writing with the consent of all parties. This agreement shall remain in effect until cancelled by a subsequent LOA.

7. ATTACHMENTS:

a. Attachment 1. Stone Bay UAS Area

b. Attachment 2. Sample DoD Class G Notification ASN#XXXX-ESA-1-DOD Camp Lejeune, MMM YY

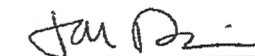


Subj: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE STONE BAY UAS  
AREA

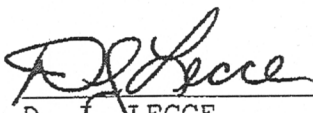
8. SIGNATURES:



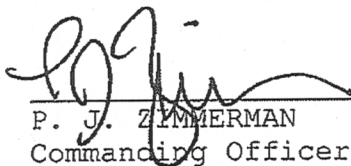
P. E. LEFEBVRE  
Commander  
MARSOC



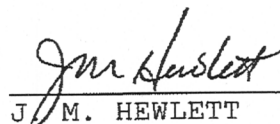
J. M. DAVIS  
Commanding General  
2d Marine Aircraft Wing



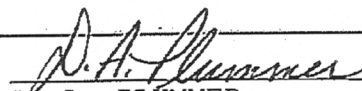
D. J. LECCE  
Commanding Officer  
Marine Corps Base Camp Lejeune



P. J. ZIMMERMAN  
Commanding Officer  
MCAS Cherry Point



J. M. HEWLETT  
Commanding Officer  
MCAS New River



D. A. PLUMMER  
Regional Airspace Coordinator  
Marine Corps Installations East

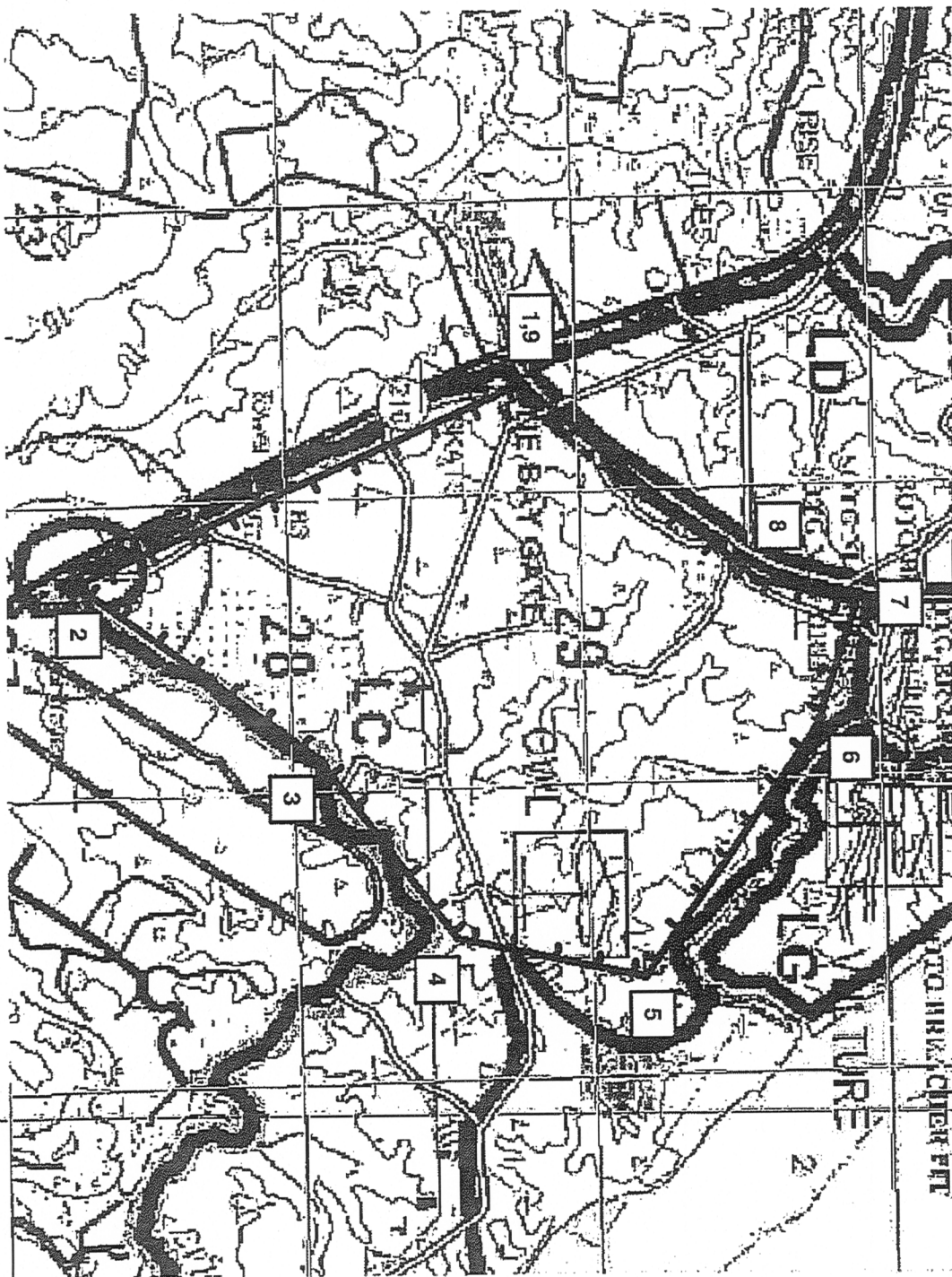


# Stone Bay UAS Area Dimensions

UNCLASSIFIED//FOUO

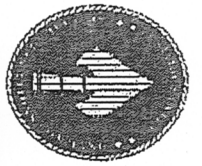


SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE MARINE CORPS BASE STONE BAY UAS AREA EFFECTIVE



Attachment (1)

UNCLASSIFIED//FOUO



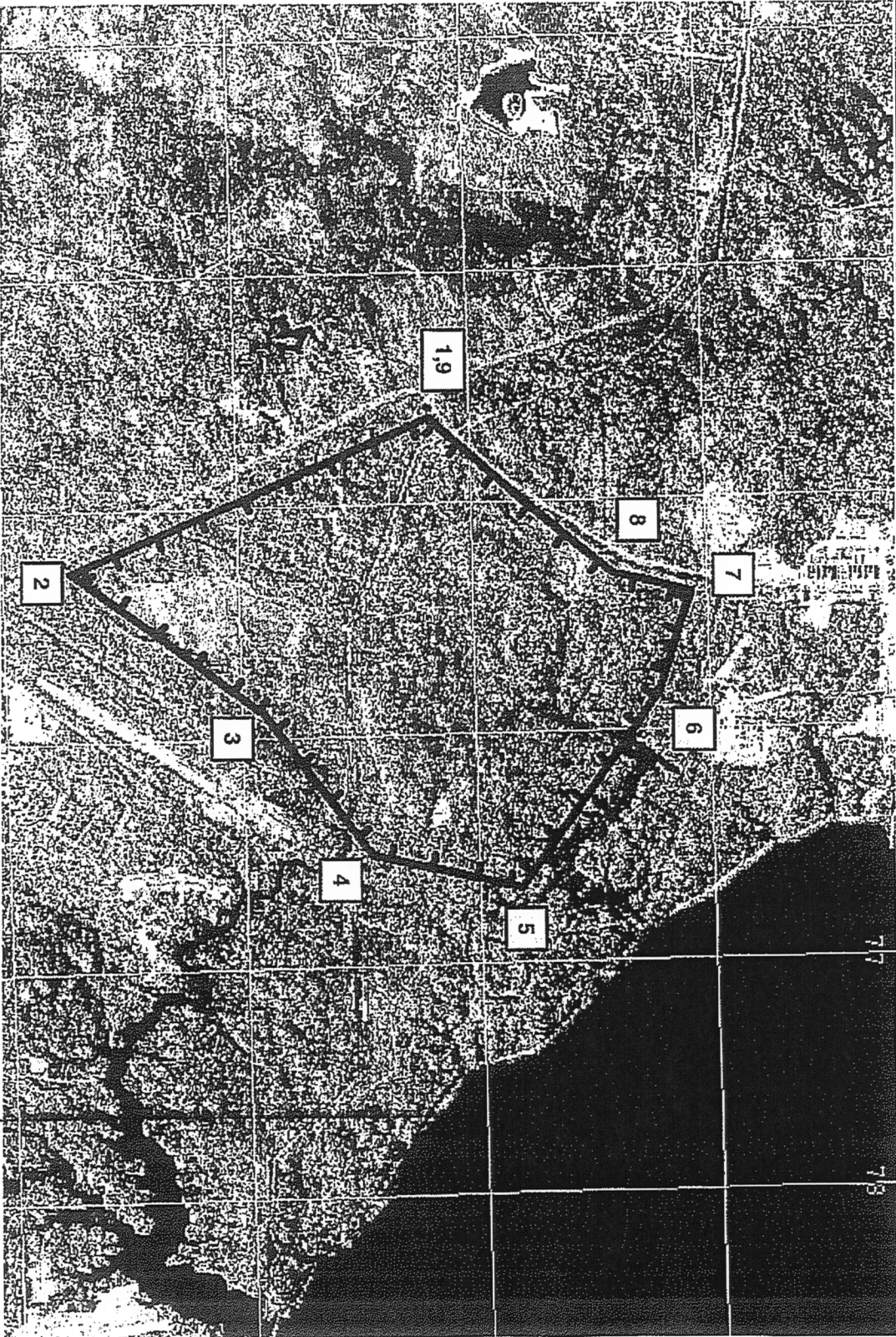
# Stone Bay UAS Area Dimensions

UNCLASSIFIED//FOUO



SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE MARINE CORPS BASE STONE BAY UAS AREA EFFECTIVE

UNCLASSIFIED//FOUO



Attachment (1)



UNCLASSIFIED//FOUO



## Stone Bay UAS Area Dimensions

- Outside Boundary defined by the following grids

1. 18S TD 74634 28828 / N34° 34' 35.55" W077° 27' 24.69"
2. 18S TD 75271 27286 / N34° 33' 46.03" W077° 26' 58.24"
3. 18S TD 75895 28094 / N34° 34' 12.73" W077° 26' 34.56"
4. 18S TD 76525 28543 / N34° 34' 27.78" W077° 26' 10.28"
5. 18S TD 76676 29183 / N34° 34' 48.66" W077° 26' 04.95"
6. 18S TD 75835 29787 / N34° 35' 07.60" W077° 26' 38.50"
7. 18S TD 75416 29932 / N34° 35' 11.97" W077° 26' 55.08"
8. 18S TD 75332 29600 / N34° 35' 01.13" W077° 26' 58.44"
9. 18S TD 74634 28828 / N34° 34' 35.55" W077° 27' 24.69"

- Altitude: SFC – 1199' AGL

SUBJ: UNMANNED AIRCRAFT SYSTEMS (UAS) OPERATIONS IN THE MARINE  
CORPS BASE STONE BAY UAS AREA EFFECTIVE

UNCLASSIFIED//FOUO

Attachment (1)



**DoD Class G Notification ASN # 2012-ESA-15-DoD****Proponent Information**

✓ Sponsor:	United States Special Operations Command (USSOCOM)
✓ Attn of:	Mr. Jeff Golliver
✓ Address:	100 Bartley Street
Address 2:	Ste. 110 S
✓ City:	Hurlburt Field
✓ State:	FL
✓ Postal Code:	32544
✓ Telephone:	(850) 884-4064
✓ Email:	Jeffrey.Golliver@Hurlburt.af.mil

**Unit Point of Contact**

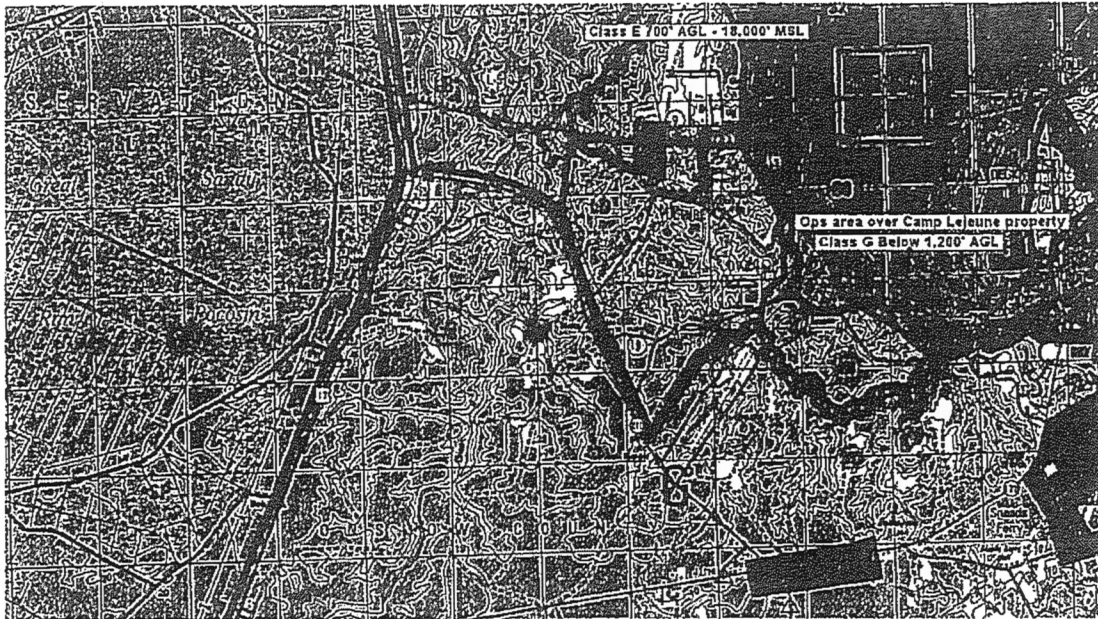
Name:	Alan Tew
Unit:	HQ Air Force Special Operations Command (AFSOC)
Phone:	(850) 884-6333
Email:	Alan.tew.ctr@hurlburt.af.mil

**Declarations**

✓ Declaration (a)	Yes
✓ Declaration (b)	Yes
✓ Declaration (c)	Yes
✓ Declaration (d)	Yes

**Operational Information**

✓ Type Of Unmanned Aircraft:	Wasp, Raven, Puma AE
✓ Latitude/Longitude	34-34-33.00N / 77-26-42.00W
✓ Dates and Times of Operation	
✓ Start	07/01/2012
✓ End	06/30/2013
Map of Operations Area	View Attachment
Remarks	UAS operations conducted by Marine Special Operations Command (MARSOC) will take place in Class G airspace below 1200' AGL. Airspace overlies the Camp Lejeune Military Installation (see attached map). This area is contained within a .75 NM radius of N34 34 33.00/W077 26 42.00 or from the DIW (Dixon NDB/DME) R050/.70 DME. Operations will only take place during official sunrise to sunset and will be IAW the FAA/DoD MOA for operation of UAS in Class G airspace. NOTAMs have been published.



# Selected NOTAMs

The following NOTAM list was selected by the user from a previous request. This list may not reflect all active NOTAMs for any of the below locations.

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Data Current as of: Mon, 02 Jul 2012 12:38:00 GMT

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## KZDC WASHINGTON (ARTCC),DC.

06/520 - AIRSPACE UNMANNED ACFT 1200/BLW .75 NMR DIW050000.7  
DALGT CTC CAMP LEJUNE RANGE CONTROL DUTY OFFICER FREQ 119.5/233.8,  
910-451-3064 EXT 4449 CALL SIGN BLACKBURN. 30 JUN 02:00 2012 UNTIL 30 JUN 02:00  
2013. CREATED: 30 JUN 00:20 2012

Number of NOTAMs selected: 1

End of Report



Cherry Point Global Hawk Letter of Agreement of Jun 26, 2007, Other UAS policy documents may be on file at MCAS Cherry Point, withheld in its entirety under exemption (b) (2), enclosure (8).

Enclosure (8)

Beaufort Global Hawk Letter of Agreement of Jun 15, 2007; Other UAS policy documents may be on file at MCAS Beaufort, withheld in its entirety under exemption (b) (2), enclosure (9).

Enclosure (9)

Enclosure (10)

# 1



OFFICE OF THE SECRETARY OF DEFENSE

1480 DEFENSE PENTAGON  
WASHINGTON DC 20301-1480

DOD  
POLICY BOARD  
ON FEDERAL AVIATION

MAY 20 2000

MEMORANDUM FOR ASD(NII) (MR GRIMES)  
OUSD(P) (MR VERGA)  
OUSD(AT&L) (MR KISTLER)  
OSD/DGC A&L (MR LARSEN)  
JCS/J-5 (BGEN DISALVO)  
DCS/G-3/5/7 (LT GEN THURMAN)  
N88 (RADM MYERS)  
DCS/A3/5 (LT GEN DARNELL)  
USMC/AVIATION (LT GEN TRAUTMAN)

SUBJECT: Department of Defense (DoD) Operations and ATC Procedures for Non-Joint-Use  
Airfields with Associated Class D Airspace

I have enclosed DoD operations and ATC procedures to operate DoD Unmanned Aircraft Systems for Service use and implementation. The procedures were developed pursuant to DEPSECDEF memorandum, Subject: Memorandum of Agreement for Operation of Unmanned Aircraft Systems in the National Airspace System dated 24 September 2007. They meet the requirements of the "DoD-FAA MOA Concerning the Operation of DoD UAS in the NAS" entered into by the FAA Administrator and the Deputy Secretary of Defense effective 24 September 2007. The procedures when employed properly will simplify and expedite UAS COA approvals at DoD airfields.

These procedures were developed by Service operations and air traffic control subject matter experts and have been coordinated with the FAA. They should be considered an integral part of DoD airfield operations and attached to all applicable UAS COA requests.

Please feel free to contact me at (703) 695-9067 or COL Allen Baker, who chaired the DoD UAS ATC Procedures Working Group, at (703) 806-4862, with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Gerald F. Pease, Jr.", is written over the word "Sincerely,".

GERALD F. PEASE, Jr., SES  
Executive Director

1 Attachment  
DoD Procedures

## **DOD Operations and ATC Procedures for Non-Joint-Use Airfields with Associated Class D Airspace**

**1. Purpose.** To meet requirements for uniform air traffic control procedures as specified in the DOD/FAA Memorandum of Agreement (MOA) Concerning the Operation of Department of Defense Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS), dated 24 September 07.

### **2. Scope.**

a. The procedures in this document outline standards for DOD operations and ATC procedures at non-joint-use airfields with associated Class D airspace conducting UAS operations.

b. These procedures are supplemental to the procedures in FAAO 7110.65S. They do not waive any ATC procedures specified in the FAAO 7110.65S except where specifically addressed in this document or the Special Provisions listed in the COA.

c. This document cannot be amended without prior coordination with the FAA.

**2. Provisions.** All personnel subject to the requirements of this document shall comply with the following provisions:

a. Applicable Federal, State, and local laws, Service Regulations, applicable Federal Aviation Regulations and orders and the DOD/FAA Memorandum of Agreement Concerning the Operation of Unmanned Aircraft Systems in the National Airspace System (DOD/FAA MOA).

b. Operation of UAS in DOD Class D airspace at non-joint-use airfields is limited to DOD UAS operations and contract operations conducted solely under the direction of Department of Defense or one of its entities.

c. All participating DOD UAS operations shall meet UAS airworthiness certification and UAS pilot/operator/crewmember qualification as outlined in the DOD/FAA MOA.

d. Prior to commencing and at the conclusion of operations, DOD ATC shall advise ATC facilities providing approach control service to the applicable airfield that Unmanned Aircraft (UA) operations are being conducted. Local coordination should be effected with adjacent ATC facilities to include normal, emergency, and contingency operations.

e. If equipped, UAs shall be operated at all times with full lighting and transponders as required by ATC.

f. For the purpose of see-and-avoid, visual observer(s) must be utilized during all UA operations. The visual observer(s) may be either ground-based or in a chase

aircraft. The observer(s) must keep the UA in sight at all times and have two way communications with the UA pilot/operator during all phases of taxi and flight. Communications must be separate from ATC and cannot be on the assigned primary ATC frequency.

g. Operations including lost link will comply with local procedures and will avoid populated areas.

h. DOD will provide briefings to all pilots of participating aircraft. Briefing will include lost link procedures, lost communication procedures, emergency procedures, contingency procedures, standard operating procedures, use of UA Zones and UA Operating Areas.

### **3. Definitions.**

a. Joint-use airfield: A DOD airfield with a contract/agreement with a government entity to sponsor a public airport.

b. Participating aircraft: DOD and DOD-contracted aircraft whose pilots/operators have been fully briefed on UAS operations within a specific Class D airspace and agree to conduct simultaneous operations.

c. Non-participating aircraft: Any aircraft whose pilots/operators have not been briefed on specific procedures for UAS operations within a specific Class D airspace.

d. Intruder aircraft: Any aircraft operating within the Class D airspace without two way radio communication with the ATC facility per 14 CFR Part 91.

e. UA Zones: Published marshalling zones, defined by visual or GPS reference, used by UA and ATC as departure/arrival points to/from airfield. UA Zones are also used for lost link and emergency orbit points for UA.

f. UA Operating Area: Area designated for UA operations within the Class D airspace.

g. UAS VFR holding points: Geographic or GPS based locations to contain the UAS at a specific location.

h. Lost link: UAS pilot/operator has lost the ability to provide real-time control of the UAS. Loss may be permanent or temporary.

i. Lost link procedures: Pre-approved written procedures to be followed by the UAS in the event of lost link. ATC will approve and maintain a copy of all lost link procedures. Lost link procedures may make use of UA zones or UAS VFR holding points.

- j. Lost communications: UAS pilot/operator is not able to communicate with ATC.
- k. Primary radio communications: Recorded communications made between ATC and the UAS pilot/operator on local ATC tower UHF/VHF frequencies.
- l. Alternate communications: Recorded communications made between ATC and the UAS pilot/operator on a ground-to air radio or telephone.
- m. Observer: A person who is responsible to assist the UAS pilot/operator, by visual means, in meeting the requirements of FAR 91.111/113 or 115 and to relay situations that are observed which may cause a collision hazard to other aircraft.

**4. Procedures.** The following procedures will be applied at all non-joint-use DOD-controlled airfields with approved COA. Local procedures will be developed to comply with existing local traffic pattern, arrival, and departure procedures, noise abatement procedures, and airfield operating rules. Local procedures are supplementary to, but cannot waive or replace procedures in this document. Local procedures must be approved by DOD airfield ATC prior to implementation, will be published and maintained in the ATC facilities. Procedures will at a minimum address the areas below and be developed using the following guidance:

a. General Procedures.

(1) All UAS pilots/operators will comply with ATC instructions.

(2) Deconfliction of DOD aircraft will be accomplished by command and control measures.

*NOTE: Command and control will not be used for ATC procedure purposes.*

(3) Deconfliction of UA and nonparticipating traffic or non-DOD aircraft will be accomplished by use of altitude restrictions, visual holding points with specific lateral and vertical limits, use of ground observers or other locally determined procedures.

*NOTE: Use caution when transient aircraft are operating at the same time as UAS. Transient aircrews may not be as familiar with UAS types and operating characteristics, as local crews.*

(4) The UA mission commander shall advise ATC of initiation and completion of flight operations.

(5) Copy of flight schedule will be provided to ATC prior to UA operations. Deconflict manned aircraft and UA to the maximum extent possible in advance.

(6) Radio check between UA pilot/operator and ATC will be conducted prior to operations.



(7) All communications between ATC and UAS pilot/operator will be accomplished on designated primary and/or alternate ATC frequencies. Secondary/backup communications and or telephone connectivity will be precoordinated.

(8) All UAS operations will be conducted under Visual Flight Rules (VFR) in accordance with applicable Service Regulations and FARs. Increased ceiling and visibility requirements can be applied.

(9) A continuing or daily NOTAM will be issued in both the civil and military systems prior to UAS operations by contacting the servicing Automated Flight Service Station.

(10) Airfield commanders/managers will ensure appropriate flight information publications reflect UA operations within their Class D airspace.

b. ATC Procedures.

(1) Description of aircraft types. Describe UAS to other aircraft by stating "unmanned aircraft system." FAAO 7110.65S para. 2-4-21.

(2) ATIS Procedures. Make a new recording when UAS operations are in effect or have terminated for the day. FAAO 7110.65S para. 2-9-2

(3) Light Signals. Light signals will only work with UAS when line of sight with pilot/operator or observer is possible. FAAO 7110.65S para. 3-2-1.

(4) Sequencing and Spacing Application FAAO 7110.65S para. 3-8-1. UAS pilots cannot be instructed to follow another aircraft.

(5) Simultaneous Same Direction, all UAS will be treated as "other" aircraft. FAAO 7110.65S para. 3-8-3.

(6) Same Runway Separation, All UAS will be treated as Category III aircraft. FAAO 7110.65S para. 3-9-6.

(7) Use of Visual Separation between UAS and manned aircraft or UAS and UAS is not authorized. FAAO 7110.65S para. 7-2-1.

(8) SVFR is not authorized with UAS. FAAO 7110.65S para. 7-5-1.

(9) Preventative Control, FAAO 7110.65S para. 3-1-2, may only be applied between multiple UAS operating in a UAS Operating Area.

c. Development of Departure/Arrival/Operations/Emergency Procedures.

(1) UA Zones and VFR holding points will be developed to be used as departure/arrival points to and from the airfield, for lost link orbit points, emergency orbit points, and to assist ATC with spacing and sequencing.

(2) UA Zones will not be used as UA Operating Areas. UA Operating Areas will be developed for use within the Class D airspace.

d. Arrival and Departure Procedures.

Deconflict UA departures from manned aircraft using one or more of the following methods:

(1) Spatial or geographic separation

- UA only arrival/departure points
- Segregate UA departure runways/strips from primary manned aircraft runway (e.g. designated UA runway/taxiway, outlying operating area or launch trajectory).

(2) Time

(3) Holding of manned aircraft during UA arrivals/departures

(4) Hold the UAS

(5) Scheduling procedures

e. Pattern Procedures.

(1) UA will be segregated from manned aircraft utilizing one or more of the following:

- Altitude (minimum 500' vertical separation)
- Direction of traffic
- Distance from manned pattern (minimum of 1 SM)

(2) Simultaneous or concurrent use of the same traffic pattern with manned aircraft should only be done to correct or prevent an unsafe situation.

(3) All UAS will be treated as small aircraft for the purpose of applying wake turbulence rules until official UAS weight classes are determined by DOD. In addition to the requirements of FAO 7110.65S, ATC will apply the following procedures:

a) Issue cautionary wake turbulence advisories, and the position, altitude, and direction of flight to the pilot/operator of UAS landing behind all manned aircraft regardless of weight class. FAAO 7110.65S para. 2-4-21.

b) Wake Turbulence Rules cannot be waived by the UAS pilot/operator.

f. Night Operations Procedures.

(1) Night operations may be conducted if radar is used to augment observers. ATC will notify UA pilot/operators of any observed radar traffic that may enter the Class D airspace.

(2) For those airfields without radar coverage, night operations will not be conducted unless mitigation procedures for limited capabilities of observer at night is addressed and approved in COA.

g. Non-participating Aircraft Procedures. ATC will keep the UA pilot/operator apprised of any known nonparticipating aircraft operations that may impact operations. UA pilot/operator will take all necessary actions to maintain lateral and visual separation. Workload permitting, ATC should provide UA pilot/operator recommended altitudes or direct to predetermined points (UA Zones) to ensure deconfliction.

h. Intruder Aircraft Procedures.

(1) ATC will notify UA pilot/operators of any known intruder aircraft.

(2) ATC will broadcast on emergency frequencies when an intruder aircraft is present to expeditiously establish two-way radio communications with intruder aircraft.

(3) UAS pilot/operator, assisted by ATC, will determine best method to separate UAS and intruder aircraft. Examples of separation methods:

- UA may proceed to a UA Zone to hold
- Cease operations and land if it will not aggravate the situation
- Altitude deconfliction

*NOTE: Intruder aircraft will be reported to the FAA in the most expeditious manner.*

i. Emergency Procedures.

(1) UA pilot/operators will report all in-flight emergencies to ATC as soon as possible.

- Procedures to address loss of/limited controllability will make use of remote UA Zones and uninhabited areas.
- Procedures for engine malfunctions will consider engine failure during recovery.

*NOTE: UAS emergencies may not require Crash-Rescue services. The UA pilot/operator will advise ATC of required support.*

(2) ATC will apply the procedures listed in Chapter 10, Section 1 of FAAO 7110.65S. Minimum required information for in-flight emergencies:

- Aircraft identification and type
- Nature of the emergency (lost link, equipment failure)
- Intentions of the UA pilot/operator
- Aircraft altitude / position
- Fuel remaining in time

(3) During an emergency, safety of manned aircraft will be given priority.

(4) UAs within Class D airspace will be directed by ATC to land or proceed to assigned UA Zone and hold until further instructions are given by ATC.

(5) If primary radio communications between UA pilot/operator and ATC are lost, UA pilot/operator or ATC will be notified immediately via designated alternate communications method. Failure to establish or maintain radio communication between UA pilot/operator and ATC will require termination of UA operations.

(6) If lost link occurs, UAS pilot/operator will immediately notify ATC with the following information:

- a) Time of lost link
- b) Last known position
- c) Altitude
- d) Direction of flight
- e) Confirm execution of lost link procedures
- f) Confirm pilot/observer have visual contact with UA.

*NOTE: UA lost link is an emergency, but may not require Crash-Rescue services*

(7) If communications are lost between UAS pilot/operator and observer, the UAS pilot/operator will immediately notify ATC and attempt to re-establish communications.. Failure to regain communication between UA pilot/operator and observer will require termination of UAS operation. This procedure must be addressed in local procedures.

(8) In the event of permanent lost link, lost communication between UAS pilot/operator and ATC or lost communication between UAS pilot/operator and observer, ATC will do the following:

- a) Cease aircraft launches until status of affected UAS is determined
- b) Recover other UA as appropriate
- c) Issue advisories and ATC instructions as appropriate to insure the safe operation of all aircraft

(9) If UA observer loses visual/situational awareness of the UA, ATC will be notified immediately. If visual observation cannot be established, the flight shall be terminated.

Enclosure (11)



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

**North Carolina Airspace Study**

**Unmanned Aerial Systems**

**Task Force Meeting No. 1 – 10:00AM – Thursday, June 9, 2011**

**Office of the Secretary**

**Location:**

NCDOT – Downtown Raleigh  
1 South Wilmington St. Raleigh, NC 27601  
Main Conference Room – No. 150

**Purpose:**

To establish North Carolina as an industry leader in accommodating Unmanned Aircraft Systems (UAS) by establishing a suitable UAS test site for attracting businesses and jobs to the state.

**Agenda:**

1. Introductions – Name, Title, Company
2. Program Overview – Purpose, Benefits, Job Opportunities
3. Goal of the Study – Established Airspace for UAS
4. General Project Approach – Needs & Requirements, Available Airspace / Sites, Operations, Cooperative Agencies, Supporting Industries
5. Open Discussion
6. Schedule – Action Items
7. Schedule Next Meeting – July 14, 2011, 10:00 AM?

**MAILING ADDRESS:**

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**LOCATION:**

RDU AIRPORT  
1050 MERIDIAN DRIVE  
RDU NC 27623



NC UAS TF Trip Report Jun 9, 2011, withheld in its entirety under exemption (b) (5) pre-decisional, enclosure (12).

Enclosure (12)

NC UAS TF Trip Report Mar 27, 2012 withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (13).

Enclosure (13)

NC UAS TF Trip Report Jul 19, 2012 withheld in its entirety under exemption (b)(5) pre-decisional, enclosure (14).

Enclosure (14)